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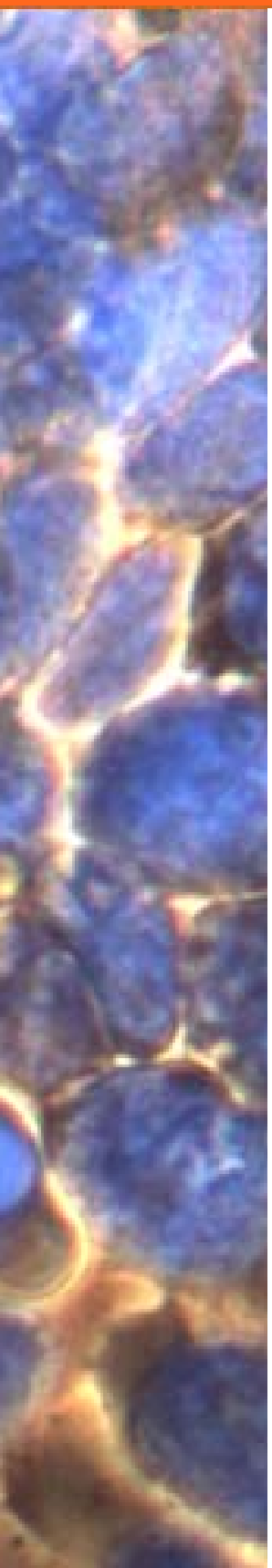
Blood Research Institute

ADAPted Chimeric Antigen Receptor controls inflammation



In Brief

A safefy improvement to existing Chimeric Antigen Receptor (CAR) therapy that controls cytokine release syndrome. Short peptides are cloned into existing CAR constructs.

Description

The invention is a method to block inflammation in cellular cancer therapies. The cells of the immune system, when they recognize target, both kill the target cell and release inflammatory cytokines to further activate the immune response. The inventive finding is that the pathways for the cell killing and cytokine response are distinct and can be controlled separately. One can control the amount of cytokine release in immune cells by expressing decoy peptides that block specific signalling pathways.

Currently, the use of chimeric antigen receptors (CAR's) is showing promise in cancer treatment but, is plagued by the cytokine release syndrome. This invention is a method to modify existing CAR vectors to include a decoy peptide sequence. The decoy peptide blocks the pathway responsible for cytokine release and controls inflammation.

Experiments are underway in human lentiviral CAR constructs in humanized mice.

Technology benefits

- Adaptable to existing cellular therapy to manage "cytokine release syndrome"
- Technology works for both T cells and NK cells
- Peptides directed to Fyn/ADAP block inflammation

Inventor

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Patent protection

WO2014055413A3 A method of providing cellular therapy using modified natural killer cells or t lymphocytes

Publication

Signaling by Fyn-ADAP via the Carma1–Bcl-10–MAP3K7 signalosome exclusively regulates inflammatory cytokine production in NK cells" Kamalakannan Rajasekaran et al. *Nature Immunology* 14, 1127-1136 doi:10.1038/ni.2708

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