Docket #: S20-341

A method to increase the anti-tumor activity of immune cells via inhibition or genetic disruption of the mediator complex

Researchers in the Mackall lab at Stanford have developed an adoptive cell therapy modification that enhances anti-tumor activity by disrupting a specific group of genes.

Adoptive cell therapies, including CAR T-cells, engineered TCR T-cells, and tumor-infiltrating lymphocytes, have the potential to treat cancer with efficacy and specificity. However, major challenges remain for the treatment of solid tumors, requiring more potent and longer lasting anti-tumor effectors.

To improve adoptive immune cell performance, the inventors have identified a group of genes that controls the T-cell function. Disrupting these genes enables T-cells to be more proliferative, produce more inflammatory cytokines, and demonstrate increased anti-cancer cytotoxicity. With recent advances in the field where CRISPR edited CAR-T cells have been used safely in humans, and with the technology for GMP CRISPR edited cells under further development, adoptive cell therapeutics could be improved by incorporating an edit to this set of genes into existing workflows.

Stage of Development

In vivo.

Applications

- Additional modification to adoptive cell therapies:

    - Enhance T-cells with disruption of a gene/group of genes
    - Potential application to tumor-infiltrating lymphocytes, macrophages, or natural killer cells

Advantages

- T-cells are more proliferative and demonstrate increased anti-cancer cytotoxicity
- Can be incorporated into existing T-cell workflows

Publications

- Freitas et al. Enhanced T cell effector activity by targeting the Mediator kinase module Science, 11 Nov 2022
- "Perspective: Improving antitumor T cells" Science, 10 Nov 2022

Patents

- Published Application: WO2022098864
- Published Application: 20250195650

Innovators

- Crystal Mackall
- Katherine Freitas
- Elena Sotillo

Licensing Contact

Minxing Li

Licensing and Strategic Alliances Manager

Email