Docket #: S21-138

Advancing CAR-T Cell Therapies with Memory-Like Traits

Researchers at Stanford University have discovered a way to enhance the effectiveness of CAR-T cell therapeutics through inducing a more memory-like phenotype.

Chimeric Antigen Receptor (CAR) T-cell therapies represent a burgeoning field of immunotherapy, enabling the customization of a patient's immune system to combat tumor cells. However, current iterations of CAR-T cell therapies face limitations in achieving enduring remission against various liquid and solid tumors, primarily stemming from issues like inadequate persistence and the development of T cell exhaustion.

In order to enhance CAR T cell efficacy, researchers from Crystal Mackall's group have identified the transcription factor FOXO1 as critical to CAR T cell antitumor potency. Furthermore, they find that overexpression of FOXO1 mediates a memory-like phenotype in CAR T cells, thus identifying an axis through which CAR T cells can be modulated to prevent the development of exhaustion, promote persistence, and enhance adoptive cell therapy in the fight against cancer.

Stage of Development
Research:

In vivo

Applications

- CAR-T therapeutics
- TIL therapeutics
- TCR T-cell therapeutics
- Therapeutics for liquid tumors

- Therapeutics for solid tumors

Advantages

- Longer remission from solid and liquid cancers
- Less T-cell exhaustion
- Better persistence of T-cell therapeutics

Publications

- Doan, A.E., Mueller, K.P., Chen, A.Y. et al. (2024). FOXO1 is a master regulator of memory programming in CAR T cells. *Nature*.

Patents

- Published Application: WO2023212566
- Published Application: 20250249100

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