Docket #: S22-159

Synergistic Enhancement of Cancer Treatments: Converging Anti-CD47 and CAR T Cell Therapies

Researchers at Stanford, led by Prof. Crystal Mackall and Prof. Jennifer R Cochran, have developed a unique approach to cancer treatment by tackling both the innate and adaptive immune systems.

Adoptive T-cell therapies and agents that block the CD47/SIRPα axis, which potentiate the antitumor properties of the adaptive and innate immune systems respectively, are two types of promising antitumor immunotherapeutics. When the researchers tried to combine them with the hope to enhance antitumor activity, they observed macrophage-mediated clearance of the adoptive T cells because the anti-CD47 agent also recognized the CD47 marker on these T cells.

To overcome this challenge, these researchers engineered a variant of CD47 that allows retained "don't eat me" signals on T-cells but ablates the therapeutic CD47 antibody binding. CAR-T or TCR-T cells expressing this CD47 variant were resistant to clearance by macrophages when combined with anti-CD47 antibody and resulted in synergistic enhancement in antitumor efficacy. By allowing for the combination of these two different immunotherapies, this work provides a path to immunotherapy that takes advantage of the immune system to deliver superior tumor-type agnostic control.

Stage of Development
Research: in vivo

Related Technology:
S21-084: Methods to improve CAR T cell efficacy and safety by modulating mediators of phagocytosis

Applications

- Tumor agnostic immunotherapies
- Combining anti-CD47 therapy with CAR T or TCR T cell therapies

Advantages

- Superior efficacy to existing treatments
- Allows targeting of solid tumors
- Combines innate and adaptive immune responses in cancer therapies, removing pathways of tumor resistance

Publications

- Yamada-Hunter, S.A., Theruvath, J., McIntosh, B.J. et al. Engineered CD47 protects T cells for enhanced antitumour immunity. Nature (2024).

Patents

- Published Application: WO2024159160

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