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Highly Effective B7-H3 CAR-T Cells for Targeted Cancer Therapy

Stanford researchers have developed a highly effective B7-H3 chimeric antigen receptor (CAR) for CAR-T cell therapy, designed to enhance binding and cytotoxicity against B7-H3 expressing solid tumors, offering a promising treatment for various cancers.

Current CAR-T cell therapies targeting B7-H3 have shown limited clinical efficacy in treating solid tumors due to variable B7-H3 expression and T-cell exhaustion. Existing CAR designs often include CD8 and 41BB domains, which may not optimize binding and cytotoxicity. Additionally, there is a need for CAR-T cells that can effectively target a broader range of B7-H3 expressing cancers with reduced side effects.

This technology addresses these issues by providing a CAR-T cell with a different hinge-transmembrane domain, enhancing binding and cytotoxicity while minimizing T-cell exhaustion. This innovative design improves the CAR-T cells' ability to target and destroy cancer cells more effectively, reducing the likelihood of T-cell exhaustion and enhancing overall treatment efficacy. The result is a more potent and versatile therapeutic option for a wide range of B7-H3 expressing cancers, including those that have been difficult to treat with existing methods.

Stage of Development
Pre-clinical: Entering clinical trials

Applications

- **Immunotherapy** for treatment of B7-H3 expressing solid tumors, including brain, breast, and pancreatic cancers
- Therapeutic use in **pediatric solid tumors**
- Potential for intracerebral administration post-tumor resection

Advantages

- **Enhanced binding and cytotoxicity** against solid tumors with variable B7-H3 expression
- **Improved clinical efficacy** with reduced T-cell exhaustion
- Effective in treating a **wide range of B7-H3 expressing cancers** including alveolar & embryonal rhabdomyosarcoma, Ewing sarcoma, nephroblastoma, neuroblastoma, ganglioneuroblastoma, ganglioneuroma, medulloblastoma, and high-grade gliomas

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