

# Cyborg Chimeric Antigen Receptor (CAR) T Cells for Targeted Cancer Immunotherapies

**This technology involves the in situ bioconjugation of synthetic peptides onto universal chimeric antigen receptor (CAR) T cells, enhancing their ability to target and destroy cancer cells.**

## What is the Problem?

Current CAR T-cell therapies have shown significant success in treating hematologic cancers but face challenges when applied to solid tumors. These challenges include the heterogeneity of tumor antigens and the limited ability of antigen-specific CAR T cells to effectively target and eliminate solid tumor cells. There is a need for more versatile and effective CAR T-cell therapies that can address these limitations and improve outcomes for patients with solid tumors.

## What is the Solution?

The technology utilizes in situ bioconjugation of synthetic peptides onto universal CAR T cells. This approach employs SpyCatcher003-SpyTag003 chemistry to covalently attach synthetic biomaterials to CAR T-cell receptors in vivo. This modification enhances the CAR T cells' ability to recognize multiple cell-surface antigens and target cancer cells more effectively. By using bifunctional adaptor intermediates, the technology allows for precise and modular redirection of CAR T-cell effector functions, making the therapy adaptable to various cancer types and improving its efficacy in solid tumors.

## What is the Competitive Advantage?

**Versatility:** The use of synthetic peptides and bifunctional adaptors allows for the customization of CAR T cells to target a wide range of tumor antigens.

**Enhanced Targeting:** The in situ bioconjugation process improves the specificity and effectiveness of CAR T cells in recognizing and attacking cancer cells.

**Safety:** The modular nature of the technology enables better control over CAR T-cell activity, potentially reducing off-target effects and improving patient safety.

**Broad Applicability:** This technology can be applied to both hematologic and heterogenous solid tumors, expanding the potential patient population that can benefit from CAR T-cell therapies.

## Patent Information:

## Technology ID

BDP 8772

## Category

Selection of Available  
Technologies  
Therapeutics/Other

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## Learn more



## References

1. Cardle, I. I., Scherer, D. R., Jensen, M. C., Pun, S. H., Sellers, D. L.(2025) ,  
<https://pubs.acs.org/doi/10.1021/acsnano.4c16824>, <https://pubs.acs.org/journal/ancac3>, 19,  
5750-5768