# T cell Secretion of Engineered Enzymatic Weapons for Solid Tumor Translation

**Immunosuppressive environments limit effectiveness of CAR-T Cell therapies**

The problem with current CAR-T cell therapies is their limited effectiveness against solid tumors due to the immunosuppressive environment created by adenosine. This innovation involves genetically modifying human cells to secrete an HsADA2 enzyme variant that breaks down adenosine, enhancing the ability of CAR-T and other T cell therapies to overcome this suppression. By equipping T cells with this enzyme, the therapy improves its specificity and efficacy against tumor cells. This first-of-its-kind method addresses adenosine-mediated immunosuppression and enhances the overall success of immunotherapy in treating solid tumors.

**Novel technology overcomes immunosuppressive environment by using genetic modification**

The innovation involves genetically modifying human cells to secrete enzymes that break down adenosine, a molecule that hampers the effectiveness of CAR-T cell therapies in solid tumors. By equipping CAR-T and other T cell therapies with this capability, we enhance their ability to overcome the immunosuppressive environment of solid tumors, marking a significant advancement in immunotherapy.

**Summary Bullets**

- This innovation involves genetically modifying human cells to secrete an enzyme that breaks down adenosine, enhancing CAR-T and other T cell therapies' effectiveness against solid tumors.
- The prototype addresses adenosine-mediated immunosuppression, improving therapy specificity and efficacy in treating solid tumors.
- It has commercial applications in enhancing CAR-T cell therapies and other immunotherapy treatments for various cancers, marking a significant advancement in cancer care.

Solution Advantages

- First-of-its-kind method allowing T cells to secrete a metabolic enzyme with immunomodulatory functions.
- Applicable to CAR-T cells, enhancing their specificity and efficacy against tumor cells.

- Overcomes redundancies in adenosine production and signaling that limit current therapies
- Direct targeting of adenosine.

Potential Commercial Applications

- Enhanced CAR-T cell therapies for the treatment of solid tumors.
- Immunotherapy treatments leveraging genetically modified T cells for improved cancer care.
- Potential extension to other autologous T cell therapies targeting a variety of cancers.Research tool for immune cell manipulation across species, ages, and subtypes.

## Inventors

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## IP Status

<p>The following patent has issued</p>: WO2023086920A2

## Publications

Rational engineering of an improved adenosine deaminase 2 enzyme for weaponizing T-cell therapies, Immuno-Oncology and Technology - 2023

## Images

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