

Combination of recombinant IL-7 with Chimeric Antigen Receptor (CAR) T Cells Targeting Glypican-3 (GPC3) for the Treatment of Hepatocellular Carcinoma (HCC)

Summary

Researchers at the National Cancer Institute developed a combination immunotherapy using Glypican-3 (GPC3)-targeted chimeric antigen receptor (CAR) T cells and a recombinant IL-7 drug for the treatment of hepatocellular carcinoma (HCC).

NIH Reference Number

E-108-2021

Product Type

- Therapeutics

Keywords

- Chimeric Antigen Receptor T Cell Therapy, CAR, Tumor Specific Antigen, Liver, Hepatocellular Carcinoma, HCC, glypican-3, GPC-3, Interleukin-7, Recombinant IL-7, Ho

Collaboration Opportunity

This invention is available for licensing and co-development.

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Description of Technology

Hepatocellular carcinoma (HCC) is the most common type of liver cancer. standard treatment for HCC is not suitable for a large proportion of liver cancer patients. As a result, alternative treatments are needed. Chimeric antigen receptor (CAR) T cell therapy is a promising alternative approach selectively targets targeting tumors via tumor-specific antigens. However, to date, no effective CAR T cell therapy exists for HCC.

Glypican-3 (GPC3) is a cell surface proteoglycan preferentially expressed in HCC. National Cancer Institute (NCI) researchers previously demonstrated that GPC3-targeting CAR T cell therapy was a promising therapeutic in preclinical animal models of HCC. Furthermore, it was reported that IL7 improved T cell or CAR T cell efficacy via enhancing CAR T cell persistence and survival.

Researchers in the NCI's Laboratory of Molecular Biology (LMB) found that a single treatment of a recombinant IL-7 significantly improved the efficacy of GPC3-targeted CAR T cell therapy for over 4 weeks in mice bearing human HCC tumors. The superior efficacy indicated that combination of recombinant IL-7 treatments with GPC3-targeting CAR T cells may improve the efficacy of treating HCC in patients.

Potential Commercial Applications

- Combination immunotherapy for HCC

Competitive Advantages

Combining recombinant IL-7 with the CAR T cell therapy improves efficacy to treat HCC

Inventor(s)

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Development Stage

- Pre-clinical (in vivo)

Patent Status

- **U.S. Provisional:** U.S. Provisional Patent Application Number 63/196,556, Filed 03 Jun 2021

Related Technologies

- [E-136-2012 - High-Affinity Mouse Monoclonal Antibodies to GPC-3 for Liver Cancer Research](#)
- [E-016-2018 - New Chimeric Antigen Receptor \(CAR\) Format for Developing Improved Adoptive Cell Therapies](#)

Therapeutic Area

- Cancer/Neoplasm
- Immune System and Inflammation

Updated

Thursday, April 13, 2023

Source URL: <https://techtransfer.cancer.gov/availabletechnologies/e-108-2021>