



iNKT cell engagers

An immunotherapy platform capable of enhancing the anti-tumour efficacy of invariant natural killer T cells (iNKT).

Proposed use

Bispecific iNKT cell engagers are artificial molecules capable of bridging cancer cells and iNKT cells. They can be used to enhance the modularity and the efficacy of iNKT cells as an 'off-the-shelf' platform for the treatment of myeloma, other blood or solid tumour cancers.

Problem addressed

Immunotherapy of cancer often requires targeting more than one tumour antigen, whereas cellular immunotherapy is best served by using 'off-the-shelf' treatments. The cellular immunotherapy platform is being developed as an 'off-the-shelf' option, without the need for genetic engineering, that can enhance the modularity of iNKT cells and thus their anti-tumour activity.

Technology overview

iNKT cell engagers have been designed to harness the unique characteristics of iNKT cells, combining their innate and adaptive immune responses. Specifically, one form of iNKT cell engagers such as bispecific iNKT cell engagers (biNTE) consist of two arms: one engaging the invariant T Cell Receptor (ITCR) on iNKT cells, while the other targets tumour antigens. This design enhances the modularity of adoptive iNKT cell therapy, providing a versatile platform for targeting multiple tumour types. The iNKT cell engager concept lends itself to potentially even more powerful designs including bi-epitope or tri-specific engagers.

Researchers have demonstrated the specificity of biNTE in binding iNKT cells and tumor antigens, as well as their potent cytotoxicity against BCMA-expressing myeloma cells in pre-clinical models. Importantly, biNTE retain the ability to engage CD1d, suggesting potential synergy with activating glycolipid ligands. With promising results in pre-clinical studies, biNTE represent a groundbreaking advancement in immunotherapy, capable of revolutionising the treatment landscape for blood cancers and beyond.

Benefits

- A novel, 'off the-shelf', and highly flexible therapeutic module.
- Bridges iNKT cells and cancer cells
- Enhances anti-tumour efficacy of iNKT cells
- Enhances anti-tumour efficacy of CAR-iNKT cells

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Intellectual property information

A Greek priority patent application was filed on 31st of October 2023 and a corresponding GB priority patent application was filed on 1st of November 2023.

Link to published paper(s)

<https://ashpublications.org/blood/article/142/Supplement%201/4828/504671/Development-of-Novel-Invariant-TCR-Anchored>

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