

## Transforming T-cells for treatment of cancer and infectious diseases



A Very Happy New Year 2023 to one and all!

As the New Year begins, I have a bit of happy news to share with you all!

Traditionally untreatable cancers can now be treated.

A new experimental study has shown that people with untreatable cancers can have their immune system redesigned to attack their own tumours.

Normally, T cells patrol the body and check for signs of infection or cancer in cells, help protect the body from infection or cancer either by directly killing the host cells, activating other immune cells, or producing cytokines, thus regulating immune response. Usually, the number of T cells with receptors to detect cancer cells are few and rare. This experimental study involves harvesting of a few of these T cells along with other T cells that cannot detect the cancer. The receptors on the latter are replaced with those from the cancer searching T cells. So there is a boost in levels of cancer spotting T cells tailored for each patient for their specific tumour. These T cells then help in treating the cancer. In this experimental study, modified T cells were finding their way into the tumour.

Tumour Infiltrating lymphocytes (TIL) and CAR-T (Chimeric antigen receptor T-cell therapy) involve collecting immune cells and either growing, culturing and genetically engineering them. These modified T cells are then put back into the patient in large numbers to seek and attack the tumour. All this has been possible because of the gene editing technology CRISPR. These T cells are powerful, immune cells and can remain in the body for long after the treatment has been completed and thus give a long-term remission.

However, they have to be tailored to the individual patient and the process is expensive, laborious and time consuming. Research is on to facilitate production of these immune cells in large quantities, to be stored for extended periods so that they can be safely used to treat a wide range of patients with various cancers.

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