Single CAR-T Cells Can Save Or Kill A Cancer Patient

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Many exciting new cancer treatments are designed to let the patient's own immune system kill their cancer cells. The results can be remarkable and have saved many lives already. Two unusual cases show the power, and danger, of CAR-T cells, a type of immune-based cancer treatment.

The treatments used in both cases are called CAR-T cells. In this therapy, immune cells are removed from patients and genetically altered to contain a receptor (like a key) that is able to recognize and kill their cancer by sticking to a protein (the lock) on the cancer cells.

In one case, a 20 yr old patient with acute lymphoblastic leukemia (ALL) was treated with CAR-T cells. The patient got better very quickly, but then his cancer came back and he ultimately died from the disease. When the researchers looked at the cancer cells that killed him, they realized that they had **accidentally** inserted the receptor gene into a cancer cell taken from his body. When put back into the patient, that single cell was not 'killable' by the CAR-T cells and multiplied until it killed him.

Learn more about this case.

In the second case, a 78 yr old man with chronic lymphocytic leukemia (CLL) was treated with CAR-T cells and had a great response. When the researchers looked at his immune cells, they found that the response was due almost entirely to the reproduction and activity of a single CAR-T cell. Closer inspection revealed that a gene called TET2 had been altered during the production of this particular CAR-T cell. That lucky change seems to have super-charged that cell, allowing it to eliminate the cancer. Researchers are now looking into the role of TET2 in CAR-T therapy. It could leard to great news for many other cancer patients!

Learn more about this case.

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