

Gene therapy shows promising results in leukemia patients

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Twenty-seven of 29 patients with an advanced type of leukemia that had proved resistant to multiple other forms of therapy went into remission after their T cells (disease-fighting immune cells) were genetically engineered to fight their cancers.

The immune system — a complex conglomerate that includes disease-fighting cells and proteins — is well-known for its remarkable ability to locate, recognize and attack invaders like the common cold. However, the immune system is not always able to eliminate cancer cells when they form. And once malignant tumors develop, they can use a variety of evasion tactics to outwit the immune system.

This experimental therapy is designed to overcome some of these challenges, harnessing the power of the immune system to fight cancers by genetically engineering patients' T cells with a synthetic receptor molecule called a CAR (for chimeric antigen receptor) that empowers the T cells to recognize and kill cancer cells that bear a specific marker, called CD19.

After patients' T cells were extracted from their bodies, a specialized virus delivered the DNA instructions for making the CAR into the cells. Then, the cells were multiplied to the billions in the lab. After chemotherapy, the now-reengineered cells were infused back into the patients they came from about two weeks after they were first extracted.

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