Autologous CAR T-Cell Therapy Process

T cells are collected from a patient. T cells are collected via apheresis, a procedure during which blood is withdrawn from the body and one or more blood components (such as plasma, platelets or white blood cells) are removed. The remaining blood is then returned to the body.

T cells are reengineered in a laboratory. The T cells are sent to a laboratory or a drug manufacturing facility where they are genetically engineered, by introducing DNA into them, to produce chimeric antigen receptors (CARs) on the surface of the cells.

After this reengineering, the T cells are known as "chimeric antigen receptor (CAR) T cells." CARs are proteins that allow the T cells to recognize an antigen on targeted tumor cells.

The reengineered CAR T cells are then multiplied. The number of the patient's genetically modified T cells is "expanded" by growing cells in the laboratory. When there are enough of them, these CAR T cells are frozen and sent to the hospital or center where the patient is being treated.

At the hospital or treatment center, the CAR T cells are thawed and then infused into the patient. Many patients are given a brief course of one or more chemotherapy agents, called "lymphodepletion," before they receive the infusion of CAR T cells. CAR T cells that have been returned to the patient's bloodstream multiply in number. These are the "attacker" cells that will recognize, and attack, cells that have the targeted antigen on their surface.

The CAR T cells may help guard against recurrence. CAR T cells may eradicate all of the cancer cells and may remain in the body months after the infusion has been completed. The therapy has resulted in long-term remissions for some types of blood cancer.