CD33CAR-CD3zeta-4-1BB-expressing Autologous T-Lymphocytes

National Cancer Institute

Source

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Autologous T-lymphocytes transduced with a retroviral vector expressing a chimeric antigen receptor (CAR) consisting of an anti-CD33 scFv (single chain variable fragment) coupled to the signaling domain of 4-1BB (CD137) and the zeta chain of the T-cell receptor (TCRzeta), with potential immunomodulating and antineoplastic activities. Upon transfusion, CD33-specific CAR retroviral vector-transduced autologous T lymphocytes target CD33-expressing tumor cells and induce selective toxicity in CD33-expressing tumor cells. Following binding to CD33, the 4-1BB co-stimulatory molecule signaling domain enhances both activation and signaling. Inclusion of the 4-1BB signaling domain may also increase the antitumor activity when compared to the inclusion of the CD3-zeta chain alone. CD33 is expressed on normal non-pluripotent hematopoietic stem cells as well as on myeloid leukemia cells.