Autologous Anti-Muc1/CD33/CD38/CD56/CD123 Gene-engineered CAR-T Cells

National Cancer Institute

Source

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A preparation of genetically modified autologous T-cells transduced with lentiviral vectors expressing chimeric antigen receptors (CARs) specific for the tumor-associated antigens (TAAs) mucin 1 (Muc1; MUC1), cluster of differentiation 33 (CD33), CD38, CD56 and CD123 (interleukin-3 receptor alpha chain or IL3RA), with potential immunostimulating and antineoplastic activities. Upon intravenous administration, autologous anti-Muc1/CD33/CD38/CD56/CD123 gene-engineered CAR-T cells are directed to and induce selective toxicity in Muc1/CD33/CD38/CD56/CD123-expressing tumor cells. Muc1/CD33/CD38/CD56/CD123 are present on certain tumor cell types and are minimally expressed on normal, healthy cells. Expression of these TAAs are correlated with poor prognosis. CD28, CD137 and CD27, T-cell surface-associated co-stimulatory molecules included in the CARs, are required for full T-cell activation and enhance both proliferation of T-cells and antitumor activity.