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Chimeric Antigen Receptor T-Cell Therapy for Solid Tumors

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Abstract

We review chimeric antigen receptor (CAR) T-cell therapy for solid tumors. We discuss patient selection factors and aspects of clinical management. We describe challenges including physical and molecular barriers to trafficking CAR-Ts, an immunosuppressive tumor microenvironment, and difficulty finding cell surface target antigens. The application of new approaches in synthetic biology and cellular engineering toward solid tumor CAR-Ts is described. Finally, we summarize reported and ongoing clinical trials of CAR-T therapies for select disease sites such as head and neck (including thyroid cancer), lung, central nervous system (glioblastoma, neuroblastoma, glioma), sarcoma, genitourinary (prostate, renal, bladder, kidney), breast and ovarian cancer.

Keywords: Antigen selection; Cellular engineering; Chimeric antigen receptor; Clinical trials; Solid tumors; Tumor microenvironment.

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