ENGINEERED CAR T CELL THERAPY FOR SOLID TUMORS

Juan F. Vera, enter for Cell and Gene Therapy, Baylor college of medicine, Texas Children’s Hospital
jfvera@txch.org

Pradip Bajgain, enter for Cell and Gene Therapy, Baylor college of medicine, Texas Children’s Hospital
Sujita Sukumaran, enter for Cell and Gene Therapy, Baylor college of medicine, Texas Children’s Hospital
Alejandro Torres, enter for Cell and Gene Therapy, Baylor college of medicine, Texas Children’s Hospital
Norihiro Watanabe, enter for Cell and Gene Therapy, Baylor college of medicine, Texas Children’s Hospital
Malcolm Brenner, enter for Cell and Gene Therapy, Baylor college of medicine, Texas Children’s Hospital
Ann Leen, enter for Cell and Gene Therapy, Baylor college of medicine, Texas Children’s Hospital

Key Words: Cell Therapy, CAR-T

The adoptive transfer of T cells redirected to tumor-associated antigens via transgenic expression of chimeric antigen receptors (CARs) has produced impressive clinical responses in patients with hematologic malignances. However the successful extension of this therapy to solid tumors has proven challenging due to i) the paucity of target antigens that are tumor selective, leading to a heightened risk of “on-target, off-tumor” toxicities and, ii) the suppressive tumor microenvironment, which subverts T cell effector function. Therefore, to overcome these limitations we have programmed T cells with a combination of receptors that recognize a gene expression pattern that is unique to the tumor site and whose endodomains deliver intracellular signals 1, 2 and 3 (antigen, co-stimulation and cytokine) required for optimal T cell activation and protection from suppressive factors present at the tumor site. The current presentation will not only highlight our T cell engineering improvements but also our process optimization, including the incorporation of the G-Rex device, to facilitate the clinical and commercial development of potentially curative therapies.