
CARMA-Buster - Transforming Solid Cancer Treatment with a dual CAR-T and CAR-Macrophage cell product

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Despite significant advances in immunotherapy, solid tumors remain largely refractory to established CAR-T cell therapies. The main reasons for this are the immunosuppressive tumor microenvironment, physical barriers within the tumor tissue, and insufficient infiltration and persistence of CAR-T cells.

The CARMA-BUSTER project addresses these limitations by developing an innovative dual cell therapy approach that expands and combines CAR-T cells with CAR-modified macrophages (CAR-M). While CAR-T cells are used for targeted tumor cell killing, CAR-M cells play an active role in reshaping the tumor microenvironment. Through phagocytosis, cytokine and chemokine secretion, and the degradation of extracellular matrix structures, CAR-M cells are expected to improve tumor infiltration, function, and persistence of CAR-T cells. To produce allogeneic, off-the-shelf CAR-M cells the project uses induced pluripotent stem cells (iPSCs). This approach enables standardized, scalable, and cost-efficient production with high reproducibility and product quality, laying the foundation for a fully allogeneic dual cell therapy platform in the future.

The project aims to demonstrate the preclinical efficacy and safety of the combined CAR-T/CAR-M approach and to advance preparations for clinical development. Key milestones include the optimization of macrophage-specific CAR constructs, the demonstration of synergistic anti-tumor effects in preclinical models, and the creation of a robust data package in preparation for a clinical trial application.
