NEXT-GENERATION PAN-CANCER IMMUNOTHERAPY WITH PATIENT-DERIVED APC

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Background In the realm of cancer immunotherapy, immune cell-based treatments utilizing monocytes-derived macrophages and dendritic cells (DCs) have emerged as a formidable force. These phagocytic antigen-presenting cells (APCs) hold immense potential in the battle against cancer. Not only do they possess the remarkable ability to devour cancer cells, effectively 'eating off' tumors, but their true power lies in their role as orchestrators of antigen presentation, igniting a cascade of tumor-specific adaptive immune responses. These responses include the activation of tumoricidal T cells and the generation of long-lasting anticancer antibodies. Despite these promises, a significant hurdle obstructs the clinical application of APC therapy: the formidable challenge of inducing robust differentiation of monocytes from cancer patients into proinflammatory DC/macrophage-like APCs. This obstacle hampers the realization of the therapy's full potential.

Methods Through our pioneering and proprietary process, we have achieved a breakthrough in the field of immunotherapy. Introducing our revolutionary cellular agent, known as KX1 and KX2, which has the exceptional capability to robustly differentiate monocytes derived from cancer patients, aptly referred to as cancer monocytes (cMo), into remarkably potent antigen-presenting cells (kAPC).

Results kAPCs, as a unique type of APC distinct from macrophages and DCs, exhibit remarkable enhancements in both phagocytic capabilities and antigen presentation machinery. This leads to amplified uptake and presentation of tumor neoantigens, triggering the activation of tumor-specific CD4 and CD8 T cells derived from patients' tumor-infiltrating lymphocytes (TILs) or peripheral T cells. The expanded population of tumor neoantigen-specific CD8 T cells demonstrates potent tumoricidal activity, as validated in both murine and human tumor models. Additionally, the CD4 T cells play a pivotal role in generating immunological memory and fostering a conducive environment for the activation, expansion, and synergy of CD8 T cells, NK cells, and other anti-cancer effectors. Notably, kAPCs possess their own distinct mRNA expression profile, further emphasizing their unique identity and functional characteristics within the realm of APCs.

Conclusions The immune therapy based on KAPC and tumor neoantigen-specific T cell is a groundbreaking technology in the field of cancer immunotherapy, representing a significant advancement for future tumor immunotherapy.

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