The Functionality of Memory T Cells in Preventing AML Relapse in Patients Treated with a Fusion Vaccine

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Immunotherapy has shown promise as a treatment approach for patients with hematologic malignancies by engineering one's immune system to better target a particular antigen. Treatment for hematologic malignancies and relapse prevention has been proposed using a patient's tumorigenic cells fused to their dendritic cells ex vivo, administered as a vaccine. Anti-PD1 drugs, which block interactions between PD1, a receptor expressed on the surface of T-cells, and PDL1, a ligand expressed on the surface of cancer cells, have been found to enhance the vaccine's productivity when inoculated simultaneously. Acute Myeloid Leukemia (AML), a potentially fatal cancer of the blood and bone marrow, has a notable history of recurring in previously treated patients. The fusion vaccine has been used as treatment for AML; its success suggests dependency on memory T-cells. Because memory T-cells are programmed to target antigens they have already encountered, memory T-cells exposed to AML and immunotherapy treatment in vitro could serve as a treatment strategy for patients. The functionality of memory T-cells was evaluated by extracting T-cells from AML mice that received no treatment, treatment involving the fusion vaccine, or treatment involving the fusion vaccine and anti-PD1, and injecting those T-cells into AML transgenic mice. Viability and tumor volume were evaluated using infrared imaging every week for five weeks. AML mice that had been treated with T-cells exposed to the fusion vaccine and anti-PD1 had the lowest tumor volumes, confirming the functionality of memory T-cells and demonstrating the efficacy the fusion vaccine and anti-PD1 as a viable cancer therapy.