On a Mission: Rescuing T-Cells to Fight Cancer

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Immunotherapy, the interaction between cancer and immune cells, is one of the most promising treatments for cancer. A prominent research area is the B7-H1/PD-1 pathway. PD-1 (programmed cell death protein-1) is a protein on T-cells; B7-H1 is its counterpart. Binding PD-1 and B7-H1 allows cancer cells to remain undiscovered by the immune system, causing growth in tumors. In this study, novel discoveries were made regarding the B7-H1/PD-1 pathway, allowing for future research on ‘rescuing’ T-cells to fight cancer. 624-mel, a melanoma cancer cell line; Bim, a pro-apoptopic protein; CD8 T-cells; and p38 MAPK inhibitors were studied in detail, along with their roles in fighting cancer. It has been found that expression of the B7-H1/PD-1 pathway up-regulates Bim, which causes increased apoptosis of T-cells. This discovery reveals a new mechanism to how B7-H1 regulates T cell apoptosis, which can further studies in manipulation of the B7-H1/PD-1 pathway expression and blockage. Furthermore, p38 MAPK inhibitors were used to block the pathway, and a down-regulation of Bim was observed. Addition of these inhibitors ‘rescued’ T-cells by decreasing apoptosis. Increased T-cell numbers creates a greater ‘army’ to fight the tumor cells, successfully acting as a cancer treatment and decreasing tumor size.

Awards Won: