

Personalized Medicine Therapy for the Prevention and Treatment of Metastatic Cancer

When patients undergo surgery to remove a tumor, there is a chance that it may cause cancer to spread to other parts of the body. We have shown that to facilitate the process of metastasis, cancer cells utilize E-selectin for rolling adhesive interactions with the blood vessel walls, the same mechanism employed by leukocytes. Liposomes are conjugated with E-selectin and TRAIL, a cytokine involved in apoptosis signaling. Patients' own leukocytes are functionalized to these liposomes in the blood under shear flow for an effective method to kill circulating cancer cells. Patient blood samples are treated with E-selectin and TRAIL liposomes before and after surgery to determine the difference in viable cancer cells. Cancer cells are isolated using Ficoll centrifugation and magnetic activated cell sorting (MACS), stained with EpCAM and Annexin V markers, and visualized using Confocal microscopy.