CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:
RP160013

Project Title:
Visualizing T-cell trafficking

Award Mechanism:
Individual Investigator

Principal Investigator:
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Entity:
The University of Texas M.D. Anderson Cancer Center

Lay Summary:

Adoptive T-cell therapy is one of the most exciting avenues against cancer. It has proven efficacy. Progress is focused on improving T-cell tumor targeting to improve trafficking to tumors, preserving T-cell signaling and function, and improving persistence. However, methods for visualizing these events and for predicting response in patients are lacking. Progress has suffered from a dearth of clinically relevant, functional imaging methods for repetitively following immune cell trafficking, clonal expansion and persistence. This proposal will address these key issues for T-cell immunotherapy capitalizing upon designer somatostatin receptor-based reporter technology. No human reporter system which does not require its function for imaging is currently available. Such a reporter is needed for preserving complex T-cell signaling and function while enabling imaging of adoptively transferred cells. Preliminary data bouys confidence in being able to develop such a system. Overall, we hypothesize that designer SSTR2-based reporters can be created for following T-cells that are signaling deficient and do not inhibit T-cell function, yet can be used to follow T-cell trafficking, expansion, and predict efficacy. The Specific aims are to1)Test the hypothesis that human somatostatin receptor type 2 (SSTR2)-based reporters can be created that are deficient in signaling and do not interfere with T-cell function in vitro. 2)Test the hypothesis that non-invasive signaling deficient SSTR2-based reporter imaging can be used to localize T-cells in tumors and assess their expansion at the tumor site. 3)Test the hypothesis that imaging T-cells expressing signaling deficient SSTR2-based reporters can be used to predict tumor response. 4)Test the hypothesis that T-cells expressing signaling deficient SSTR2-based reporters persist against a subsequent tumor challenge. Thus, this proposal uses innovative methods to address significant unmet needs required to advance T-cell therapy.