CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:
RP160121

Project Title:
Clinical Safety and Efficacy of Third party, fucosylated, cord blood derived regulatory T cells to prevent graft versus host disease

Award Mechanism:
Individual Investigator

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

Lay Summary:

Graft versus host disease (GVHD) is a life threatening complication of allogeneic stem cell transplantation with limited therapeutic options. GVHD is primarily mediated by the donor derived T-cells and the currently available treatments are directed towards suppressing T-cells. Such therapies lead to generalized immunesuppression and are associated with toxic side effects including increased rates of infection and kidney failure. Promising, novel, cell-based therapies including naturally occurring regulatory T cells (Tregs) are being explored by the transplant community to improve outcomes. However, a major limitation in its clinical application is the low cell dose of Tregs, since it only constitutes up to 5% of peripheral or cord blood. Even with strategies geared around cell expansion, almost 20% of patients are not able to receive clinically relevant dose. In our laboratories, we have made an important discovery where by using the technique of fucosylation that decorates the cell surface of the Tregs with a sugar moiety, we are able to generate more efficient Tregs that can effectively prevent GVHD at a cell dose that is lower as compared to untreated Treg. Such fucosylated Tregs are able to better home to the sites of tissue damage and inflammation in a mouse model of human GVHD. Therefore, we propose to study the feasibility, safety and efficacy of such fucosylated Tregs in a clinical pilot study to prevent GVHD. We intend to analzye the effect of fucosylated Tregs on immune system, infectious complications and survival. If our pilot is successful, we will create a major breakthrough in the field of stem cell transplantation and pave way for application of cellular therapy for other high risk transplantation which will be one more step towards curing cancer.