CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:
RP100430

Project Title:
Cord Blood Natural Killer Cells for Patients with Cancer

Award Mechanism:
High Impact/High Risk

Principal Investigator:
Shpall, Elizabeth

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

Lay Summary:

Allogeneic hematopoietic stem cell transplantation (SCT) is the therapy of choice for selected patients with high-risk hematologic malignancies. However a significant proportion of patients – especially non-caucasian patients - are unable to find a bone marrow donor for this potentially lifesaving treatment. Umbilical cord blood (CB) has emerged as an important source of hematopoietic support in SCT patients lacking human leukocyte antigen (HLA)-matched donors. CB can be procured quickly, requires less stringent HLA matching when compared to unrelated bone marrow, and is associated with durable engraftment and a low incidence of severe graft-versus-host disease (GVHD). The immunological role of donor natural killer (NK) cells in eradication of the tumor (graft-vs-leukemia [GVL]) is increasingly recognized as a major component of successful allo SCT. Relapse following CB transplantation (CBT) remains a concern and could potentially be improved with effective NK cell function. However, NK cells harvested directly from CB have poor cytolytic activity. The central hypothesis of this proposal is that CB-derived NK cells can be manipulated ex vivo to enhance their cytolytic function and produce optimal activity against hematologic malignancies for clinical use. We aim to investigate CB NK cell therapy as described in the three specific goals described in number 3.