Award ID:
RP100484

Project Title:
Human T lymphocytes with anti-viral and anti-leukemic specificity as protection against infection and relapse after stem cell and cord blood transplantation

Award Mechanism:
Individual Investigator

Principal Investigator:
Bollard, Catherine M

Entity:
Baylor College of Medicine

Lay Summary:

Patients with life-threatening leukemia (cancer of the blood), can be cured with a bone marrow transplant (BMT) from a related or unrelated donor or cord blood transplant (CBT). However, the main causes of death after BMT are viral infections and relapse of the leukemia. Among the most common life-threatening viral infections after BMT are Cytomegalovirus (CMV), Epstein Barr virus (EBV), and Adenovirus (AdV) with infection rates up to 80%. In addition, up to 40% of patients with high-risk acute lymphoblastic leukemia will relapse after BMT. In the laboratory, Drs Dotti and Bollard (co-Principal Investigators) have developed a novel method to generate special T-cells from the BMT donor called CD19+, multivirus-specific Cytotoxic T lymphocytes (CD19-CTL). We have made a specific receptor to enable the T-cells to kill leukemia cells that have a protein on their surface called CD19. Therefore, our special CD19-CTLs are trained to not only kill CMV, EBV and AdV infected cells but will also kill residual leukemia cells after BMT. The aim of this Grant is to determine the safety and benefit of giving CD19+, multivirus-specific CTL to patients after BMT to prevent and treat life-threatening viral infections and relapsed leukemia. If the CD19-CTL cells are safe and effective, this therapy could significantly improve the quality of life and overall survival of patients with devastating cancers like high-risk acute lymphoblastic leukemia that require a BMT to save their life and can also be applied to patients receiving CBT.