



## CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:  
RP130516

Project Title:  
Clinical Application of Umbilical Cord Blood-Derived Designer T Cells

Award Mechanism:  
Individual Investigator

Principal Investigator:  
Cooper, Laurence

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

### Lay Summary:

Many leukemias and lymphomas arise from the cancerous transformation of B cells and patients with advanced disease may be successfully treated by umbilical cord blood transplantation (UCBT). This is a lifesaving procedure that infuses umbilical cord blood (UCB) after high dose chemotherapy and sometimes radiotherapy to restore the ability of the recipient to generate white blood cells (immune cells), red blood cells, and platelets. The engrafted immune system can recognize leukemia and lymphoma cells resulting in the cure of some patients. However, patients with aggressive leukemias and lymphomas still have a poor survival due to relapse of their tumor and we seek to improve their outcome by employing a new immune-based therapy. This is based on our ability to genetically modify T cells (a type of immune cell) to redirect specificity to a molecule called CD19 present of leukemias and lymphomas arising from B cells. The CD19-specific T cells can be manufactured in our laboratory to sufficient numbers and quality for human application. We have completed the regulatory and laboratory steps for the "first-in-human" application of CD19-specific T cells derived from UCB and this CPRIT application funds the trial to infuse these T cells in patients with B-cell malignancies undergoing UCBT. Companion studies will assess the potential of this T-cell therapy to treat cancerous B cells. In addition, we lay the groundwork for future trials to broaden the application of immunotherapy based upon improving the ability of infused T cells to kill malignant cells in the tumor microenvironment and survive after infusion. In summary, this grant enables Texans to be the first to receive UCB-derived CD19-specific T cells to treat B-cell malignancies using our platform technologies and helps ensure that Texans benefit from future T-cell therapies.