



## CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:  
RP160345

Project Title:  
Engineering T cells to ensure specificity for tumor cells and their environment

Award Mechanism:  
Individual Investigator

Principal Investigator:  
Arber, Caroline

Entity:  
Baylor College of Medicine

### Lay Summary:

T lymphocytes are among the most important cells of the immune system. Cancer treatments based on these cells can have dramatic therapeutic activity against some cancers, but in most patients, these therapies are not yet fully effective. Most notably, dangerous side effects can occur if the T cells are activated too strongly and begin to release harmful substances or if they attack normal organs instead of focusing only on the tumors. For these therapies, T cells from the patient's blood are processed in the laboratory to increase their ability to attack cancer cells and then returned to the patient. We have previously developed a method to safely attack a molecule present on many different cancers, but these T cells currently lack "additional features" that are needed to produce more long-lasting positive responses in patients. In this project, we will engineer T cells with our previously developed, safe cancer-directed receptor, and add such "additional features" to make the T cells function better both locally at the tumor site and in the whole body. This strategy will produce more balanced and less dangerous T cell activation. These "additional features" will enable the cancer-directed T cells we give back to the patient to survive and attack the cancer in an effective way for much longer than is currently possible. We will test this new treatment strategy in the laboratory against several blood cancers including leukemia, lymphoma and myeloma. In case successful, we expect our approach to also be applicable to patients with solid tumors. Our strategy can therefore be expected to increase the range of cancers that can be treated with T cell therapies and will grant access to these treatments to a larger group of patients with many different cancers.