



## CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:  
RP180394

Project Title:  
Targeting the metastatic sarcoma niche using leukocyte biomimetic nanoparticles

Award Mechanism:  
Individual Investigator Research Awards for Cancer in Children and Adolescents

Principal Investigator:  
Tasciotti, Ennio

Entity:  
The Methodist Hospital Research Institute

### Lay Summary:

Osteosarcoma (OS) is the most common bone tumor in the pediatric population. Patients that present or develop disseminated or metastatic disease have extremely poor survival rates. OS metastasizes via the blood stream and most frequently develops lesions in the lungs. The poor survival rates associated with a metastatic disease are a clear indication that present therapies are ineffective. Our proposed technology aims to revolutionize the current treatment of metastatic OS by developing therapies that are more effective, less toxic, and target the key pathways that govern the growth and progression of the metastatic OS cells. We will accomplish this by capturing therapeutics within a nanoparticle and testing the delivery platform in a mouse model system that mimics the initiation, development, and progression of metastatic OS. Our technology significantly enhances the advantages of liposomes, the most successful nanoparticle in the clinic to date, with the ability of white blood cells to recognize and home to inflamed vasculature, thus creating a novel drug delivery system that targets the inflammatory metastatic environment. This strategy will direct therapy towards the sites of metastasis, avoiding delivery to healthy tissues and reducing the harmful effects associated with current therapies that can be extremely detrimental in the development of pediatric patients. The inflammatory homing of our nanoparticles coupled with therapy to inhibit these pathways could eliminate the mortality associated with metastatic OS in pediatric patients. If successful, our approach could provide a therapy that can safely and effectively deliver combinations of therapies that will specifically target and eliminate metastatic OS, and provide essential new treatment options for patients afflicted with this deadly disease.