CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:
RP121048

Project Title:
Development of therapeutic vaccines/drugs against prostate cancer by Blocking immune suppression

Award Mechanism:
Bridging the Gap: Early Translational Research Awards

Principal Investigator:
Wang, Rongfu

Entity:
The Methodist Hospital Research Institute

Lay Summary:

Harnessing the immune system to eradicate malignant cells is a promising approach to cancer therapy. Recent FDA approval of sipuleucel-T (Provenge) for the treatment of metastatic prostate cancer and ipilimumab (Yervoy) for the treatment of melanoma represents milestones in the field of cancer immunotherapy. However, the clinical benefits reported for these agents have fallen far short of complete cures. Increasing evidence indicates that T cell-mediated immune suppression at tumor sites is a major obstacle to improving therapeutic efficacy of cancer vaccines and drugs. In efforts to overcome this barrier, we show that stimulation of human Toll-like receptor 8 with a Poly-Guanosine oligonucleotide (Poly-G OND), converts suppressive T cells to non-suppressive T cells, thus enhancing antitumor immunity. We reason that Poly-G OND can safely and effectively block immune suppression in cancer patients with metastatic prostate cancer, and generate tumor-specific immune response when we combine peptide vaccines with Poly-G OND treatment. To test this prediction, we recently made a GMP-grade Poly-G OND and thus are well positioned to test this novel concept in both preclinical and clinical settings. Upon completion of this project, we will have a major impact on our understanding how to overcome immune suppression in cancer patients and lead to substantial advances in the field of cancer immunotherapy. Such positive outcomes will not only improve the therapeutic outlook for metastatic prostate cancer, but also expect to spur the development of novel vaccines and drugs against other cancer in general.