



CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:
RP150454

Project Title:
Tumor Suppression Through the cGAMP/STING Pathway

Award Mechanism:
Individual Investigator

Principal Investigator:
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Entity:
Texas Agrilife Research

Lay Summary:

Our immune system is essential in protecting us against cancer. Manipulation of the host immune response is an attractive approach in cancer therapy. Interferons are important molecules in the immune system mediating antitumor and antiviral responses. However, interferons are not produced in our body under normal conditions. Bacteria or viruses can stimulate the production of interferons after they infect the host. It has been shown that the cGAMP/STING pathway activates the production of interferons. Bacterial or viral DNA can induce the activation of the cGAMP/STING pathway through the host enzyme called cGAS, which is a microbial DNA sensor in the immune system. cGAS catalyzes the synthesis of small drug like molecule called cGAMP that binds to the protein molecule called STING and triggers a cascade of signals that eventually lead to the induction of interferons. Due to these unique properties, cGAMP is a very attractive molecule for antitumor and antiviral therapy. Indeed, we have recently observed that cGAMP is a strong antitumor molecule against several types of human cancer cells. In this project, we will investigate how cGAMP suppresses the growth of tumor at molecular and cellular levels. Because we have already figured out how cGAMP binds its target STING and activate the induction of interferons, we will modify cGAMP to make it more stable and effective in suppressing the growth of cancer cells. This project will provide insight into how to develop more effective antitumor drugs that can stimulate the host immune responses against cancer.