



## CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:  
RP150498

Project Title:  
Harnessing the Cytosolic DNA Sensing Pathway for Cancer  
Immunotherapy

Award Mechanism:  
Individual Investigator

Principal Investigator:  
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Entity:  
The University of Texas Southwestern Medical Center

### Lay Summary:

Our immune system protects us not only from infections by pathogens, but also from cancer. Thanks to this powerful and elaborate immune system, most people do not develop cancer and maintain a healthy lifestyle. Unfortunately, some people succumb to cancer in part because their immune system fails to detect or eliminate cancer cells. Thus, one of the most promising strategies to combat cancer is to restore and harness the body's own immune system to recognize and eradicate cancer cells. This strategy, known as cancer immunotherapy, has recently demonstrated remarkable success in human clinical trials. However, many patients still cannot benefit from the current therapies called the immune checkpoint therapies, which work by taking away the 'brake' of the immune system. The immune system also needs the 'gas' to rev up anti-tumor immunity in order to kill cancer cells, and most patients lack the 'gas' and their immune cells do not accumulate in the tumor sites. We have recently discovered a novel pathway that likely plays a very important role in activating the body's intrinsic ability to detect and destroy tumors. This pathway is initiated by an enzyme that we named cGAS, which generates a small molecule called cGAMP that has a potent activity in stimulating immune responses. We propose to harness the cGAS-cGAMP pathway to boost anti-tumor immunity and this line of research will probably lead to the development of new cancer vaccines and therapies.