CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:
RP130078

Project Title:
Dissecting the role of IL-17 mediated inflammation as a preventive and therapeutic target in lung carcinogenesis

Award Mechanism:
Individual Investigator

Principal Investigator:
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Entity:
The University of Texas M.D. Anderson Cancer Center

Lay Summary:

Lung cancer is the leading cause of cancer death worldwide. An estimated 40,000 people in Texas will die from cancer in 2012. Approximately, one in three will be lung cancer. Chronic inflammation is increasingly recognized as a critical factor contributing to the development of a wide range of malignancies, including lung cancer. Cigarette smoke not only is a carcinogenic but also induces pulmonary inflammation. Understanding the mechanisms of pulmonary inflammation in lung cancer may help design novel treatment. We have recently identified a subset of adaptive immune cells, CD4 T helper 17(Th17)cells, which produce Interleukin-17 (IL-17) and drive inflammation in many diseases. Th17 cells are found in tissue and blood from lung cancer patients. When we adopted a mouse model of lung cancer by mutating a gene that are commonly found in human lung cancer, Th17 cells were infiltrated in the tissue from animals with lung cancer and we observed a critical role of IL-17 in lung cancer development. Therefore, we propose to identify the molecular mechanisms by which IL-17 promotes tumor growth in effort to dissect early inflammatory process in tumor. Then we adopt transgenic mice which their CD4 T helper cells are marked so their fate in tumor microenvironment can be traced. This will allow us to track the development of pathogenic CD4 helper T cells in oncogene driven lung cancer model. Lastly, we will test two different therapies that are effective in the treatment of autoimmune disease, one to block IL-17 and the other to block the development of Th17 cells to eradicate tumor. Upon completion, we will be able to understand better the mechanisms of currently available cancer therapy that target immune cells and design therapeutic reagents that are tailored depending on the nature of lung cancer. This proposal will provide a new direction targeting inflammatory process during the tumor development, which can be explored and combined with existing cancer therapy.