



CANCER PREVENTION & RESEARCH  
INSTITUTE OF TEXAS

Award ID:  
RP100443

Project Title:  
Effects from Nicotinic Receptor Variations on Smoking Behaviors and Lung Cancer Risk

Award Mechanism:  
Individual Investigator

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

Lay Summary:

Nicotine dependence results from a complex interaction of behavioral and genetic determinants. Recently, we and others identified a region of chromosome 15q that contains nicotinic acetylcholine receptor variants that influence smoking behavior and lung cancer risk. The mechanisms by which variations in nicotinic acetylcholine receptors affect smoking behavior and lung cancer risk are unknown. In this proposal we will comprehensively study variation in nicotinic receptors using state of the art sequencing technologies. Next, we will evaluate the physiological effects of these variants on signaling in neuronal and epithelial cells. We will further investigate the effects of novel variants on lung cancer risk and smoking behavior by studying a large number of lung cancer cases and controls, who have also provided information about smoking. Finally, we will assess the impact that these variations have upon responses to rewards measured by functional MRI of brains of healthy individuals. This study provides a comprehensive analysis of the impact that genetic variation of nicotinic receptors have on smoking behavior, physiology, the reward system of the brain and lung cancer risk. Understanding genetic effects on smoking dependence and lung cancer risk may lead to a better understanding of the specific mechanism by which tobacco smoke causes lung cancer.