

James & Esther King Biomedical Research Program

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*Administration
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*2009 Program
Team Science Program
(2-year project)*

Project Title: Regulation of Lung Cancer Growth by Postranslational Protein Modifications

Project Summary: The spectrum of diseases linked to tobacco use are not restricted to former smokers, but extend to those exposed to environmental tobacco smoke, making it one of this country's top health priorities. Part of the difficulty in dealing with these diseases is the complexity of the lung environment, which includes epithelial cells that become neoplastic (displaying abnormal, uncontrolled growth) and cells of the immune system that cause airway inflammatory disease. The development of these diseases is not dependent on a single cell type, but rather on changes that may occur in one cell type that are then complemented or amplified by other cells in the local environment or the immune system to cause clinically apparent disease. Studies of cell-cell communication are in their infancy, and approaches able to address this issue hold great promise in the development of useful therapies. In the case of airway disease, a class of compounds that inhibit histone deacetylase (HDAC) enzymes provides a promising therapy for both COPD (chronic obstructive pulmonary disease) and lung cancer. This grant seeks to understand how protein modification regulates cell growth, survival, and inflammatory function as they relate to cell types involved in lung disease. It is the long-term goal of this project to use the resulting knowledge to understand how tobacco use affects tumor initiation, progression, escape from immune surveillance, and therapeutic resistance in lung cancer.