

James & Esther King Biomedical Research Program

Fields, Alan

*Cancer Biology
Mayo Clinic*

*2010 Program
Research Project Grant
(5-year project)*

Project Title: Atypical PKC Signaling in Lung Cancer Stem Cells

Project Summary: Lung cancer is the number one cause of cancer death in the U.S. with a five-year survival rate of only 15 percent. Cigarette smoking, the major cause of lung cancer, is responsible for 90 percent of lung cancer cases. Our long-term goal is to better understand what drives lung tumor formation and progression, and translate this knowledge into better treatment strategies. Human lung tumors contain cells termed lung cancer stem cells that are necessary for lung tumor maintenance and progression. Given their critical role in lung cancer, lung cancer stem cells must be eliminated to effectively treat lung cancer. However, these cells are highly resistant to current cancer drugs. We have identified a gene, PRKCI, which is necessary for lung tumor formation. We hypothesize that PRKCI controls the ability of lung cancer stem cells to form lung tumors and that PRKCI is an attractive therapeutic target. In this project, we will determine how PRKCI causes lung cancer stem cells to form tumors. Completion of these studies will enhance our understanding of lung tumor formation and progression, and identify novel treatment strategies that target deadly lung cancer stem cells. These studies are a critical step in the development of new, more effective therapeutic approaches for the treatment of smoking-related lung cancer.