

James & Esther King Biomedical Research Program

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Research
South Florida Veterans Affairs Foundation

2010 Program
Postdoctoral Research Fellowship
(3-year project)

Project Title: Targeting ROS and Tumor Metabolism to Selectively Kill Cisplatin Resistant Lung Cancer

Project Summary: Lung cancer is one of the leading causes of death in the United States and the most common cancer found in South Florida. While early stage lung cancer can be treated by surgical resection, chemotherapy remains the mainstay for treatment for locally advanced and metastatic disease. Cisplatin, a platinum-based chemotherapy drug, or its analog carboplatin is one of the main drugs that has been utilized for the treatment of both small cell lung cancer (SCLC) and non-small cell lung cancer (NSCLC). Development of platinum resistance is inevitable, hinders the likelihood of achieving remission, and hence leads to poor survival. We have found that all Cisplatin-resistant lung cancer cells express higher baseline levels of oxidative stress. Moreover, these resistant cells appear to change their metabolic pathway in order to adapt to survive under high oxidative stress conditions. By identifying and targeting this pathway, Cisplatin-resistant cells can be selectively killed. We predict the knowledge gained from this work will contribute to improved treatment outcome and survival in these patients. Furthermore, identifying which patients will respond to treatment helps reduce costs and hospitalizations of cancer patients. Thus, the project not only represents a new avenue for overcoming Cisplatin-resistance but will also assist in future selection of patients who will benefit from this treatment.