

## Bankhead-Coley Cancer Research Program

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*Pharmacy  
Florida A&M University*

*2010 Program  
Postdoctoral Research Fellowship  
(2-year project)*

**Project Title:** Nanoparticle Mediated Delivery of siRNA for Treatment of Lung Cancer

**Project Summary:** Lung cancer is the leading cause of cancer death in United States. Non-small cell lung cancer accounts for 85 percent of all lung cancers, and the treatment success rate remains unsatisfactory. The long-term objective of this project is to develop novel, inhalable multifunctional nanoparticles of Vascular Endothelial Growth Factor (VEGF) Small interfering RNA (siRNA) and a widely used chemotherapy drug, Cisplatin, for lung cancer treatment. (VEGF is an important mediator of vascular development and blood vessel growth from pre-existing vessels.) The targeted nanoparticle systems will exert significant anticancer activity. Inhalation delivery of siRNA and Cisplatin using multifunctional nanoparticles is expected to overcome conventional delivery approaches and may provide a novel means of treatment. The first aim is to formulate and characterize multifunctional nanoparticle systems containing VEGF siRNA and chemotherapeutic agents. The second aim will evaluate these systems in vitro (tests done in plastic or glass vessels in the laboratory) and examine underlying mechanisms. Aim three will determine the in vivo efficacy of developed multifunctional nanoparticle systems in a model of lung metastasis and evaluate underlying mechanism(s). The data obtained from this study offers an exciting avenue for the development of inhalable siRNA-based delivery systems that may help treat lung cancer patients in Florida.