Bankhead-Coley Cancer Research Program

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Epidemiology and Public Health — *2008 Program*
University of Miami — *New Investigator (3-year project)*

Project Title: Prediction Models of Complex DNA Repair Pathways in Prostate Cancer Risk

Project Summary: Prostate cancer is the most common cancer and the second leading cause of cancer death in American men. Despite rapid advances in cancer research, the cause of prostate cancer remains largely unknown. Critical questions to predict a man's risk for prostate cancer remain unanswered. To improve strategies for prostate cancer prevention, our long-term objectives are: (i) to develop and validate prediction models of DNA repair genes in prostate cancer risk; (ii) to identify high-risk populations by validated prediction models of gene-gene and gene-environment interactions; and (iii) to reduce prostate cancer risk in genetically susceptible (sub) populations through screening and targeted intervention.

The Specific Aims are:

1) To test the hypothesis that genetic variations of DNA-repair genes contribute to prostate cancer risk
2) To test the hypothesis that gene-environment interactions play critical roles in prostate cancer risk
3) To investigate whether genetic variations impede DNA-repair function, elevate DNA damage, and contribute to prostate cancer susceptibility. Multiple DNA repair pathways are critical in maintaining genome integrity. Therefore, a comprehensive evaluation of mutations in DNA repair genes is crucial. The outcome of this research will advance our knowledge in building prediction models of prostate cancer susceptibility and identify prevention targets that can be translated into healthy behavior promotion to reduce prostate cancer risk.