

James & Esther King Biomedical Research Program

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*Risk Assessment, Detection, and
Intervention*

*H. Lee Moffitt Cancer Center &
Research Institute*

2009 Program

*Technology Transfer/Commercialization Partnership
(1-year project)*

Project Title: Centrosome Measurement in Diagnosis and Prognosis of Lung Cancer;
Validation and Optimization

Project Summary: Centrosomes organize chromosomes in the nucleus of a cell. Loss of centrosome integrity causes chromosomal instability in lung cancer. In our previous work with lung cancer cells, we identified the pathway of centrosome breakdown as well as how to alter that pathway and thus stabilize centrosome number, structure, and reduce lung cancer cell proliferation. Our novel centrosome image algorithm recognizes these changes and discriminates normal from cancer cells in culture and in a small number of histology specimens. Centrosome image analysis suggests that centrosome instability is an important target in lung cancer, a marker of abnormal and uncontrolled cell growth, a potential cellular dosimeter of chromosomal instability, and may allow individual prediction of cancer treatment response. In Aims 1 and 2, we plan to examine our earlier tissue culture observations in a case-control study of 160 lung cancer and adjacent uninvolved tissue specimens resected from patients treated and followed at Moffitt. We will determine whether quantitative centrosome assessment of an individual's lung cancer, adjusting for clinical information, identifies the cancer, and predicts treatment response and patient survival. In Aim 3, we partner with IntelliSense Design, Inc., who specializes in control software and pattern recognition, to automate image acquisition and analysis, enhancing instrument design and commercialization, to develop data for an STTR application to build and validate an instrument.