

James & Esther King Biomedical Research Program

Gillies, Robert

*Imaging Research
H. Lee Moffitt Cancer Center & Research Institute*

*2011 Program
Team Science Program
(3-year project)*

Project Title: Radiomics of Lung Cancer Screening

Project Summary: This year, 160,000 Americans will die of lung cancer, and worldwide, annual deaths will exceed 10 million by the year 2030. Significant improvements can come from earlier detection. Recently, the National Lung Cancer Screening Trial, NLST, with over 53,000 participants, showed that participants screened annually with computed tomographic (CT) had a significant survival benefit. CT scans detect “suspicious nodules”, which have to then be biopsied to determine if they are cancerous. 25% of all patients had biopsies and, of these, over 90% were not cancer, meaning that the biopsy could have been avoided. Furthermore, of the cancers detected by annual screening, 80% were aggressive and advanced when first discovered. This suggests that there is a subpopulation of patients who were at higher risk and perhaps should be screened at more frequent intervals. In this study, we will re-analyze the 75,136 CT scans in the NLST database at higher resolution with a specialized computer program developed for this purpose. These data will be used to determine if computer measurement of small, nearly invisible changes (“Radiomics”) will be able to identify those patients at higher risk, and thus who need to be scanned more frequently; and those who are lower risk, who may not need biopsies and who may be scanned less frequently. It is important to note that, if this method proves successful, it will improve the diagnostic power of CT scans with no increase in costs.