Team Progress Updates

SU2C-LUNGevity Foundation-American Lung Association Lung Cancer Interception Dream Team:

"Intercept Lung Cancer Through Immune, Imaging, and Molecular Evaluation (InTIME)"

Lung cancer is the leading cause of cancer death in the United States and worldwide. The Lung Cancer Interception Dream Team proposes several complementary strategies to help prevent patients from developing lung cancer.

The team is working to create an atlas of precancer of the lung that can help identify the types of cancerous lung tissue that will require aggressive treatment. The team is also attempting to identify treatments that can prevent these abnormal lesions from progressing to invasive lung cancer.

In addition, the researchers are developing two sets of diagnostic tools that will be able to detect lung cancer early. The first set involves using nasal swabs and imaging to confirm whether lung abnormalities found in chest images are lung cancer or benign lung disease. The second set involves the use of blood tests to identify patients at the earliest stages of lung cancer recurrence.

The team has reported the following progress:

January 2019

- The team increased accrual across their trials and presented preliminary data from single cell RNA sequencing of premalignant lesions which suggests shifts in cell types (including immune populations) in high grade lesions compared to histologically normal epithelium.

- On Aim Two, the team increased accrual from 409 to 598 patients, about two-thirds of the total needed. They have replicated the nasal gene expression signature associated with lung cancer diagnosis in the setting of indeterminate pulmonary nodules to the screening setting. They successfully developed the methodology for single cell RNA sequencing of nasal epithelium to characterize immune and epithelial cell types.

- The team has investigated a patient-specific approach to monitor circuiting tumor DNA (ctDNA) levels after surgery to detect minimal residual disease, and genomic characterization of subclones and neoantigen monitoring.

- The team has established ctDNA as a noninvasive surrogate of major pathologic response in patients.

- The team is pursuing several external collaborations involving MCL precancer atlas and Canada Stem Cell Dream Team for comparing single cell genetics and epigenetics of lung cells metastatic to the brain.

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June 2018

- The team analyzed nasal samples from 114 smokers with indeterminate lung nodules. It was able to identify 37 genes that were more active or less active in cancer tissue, which can help identify individuals who are at risk of eventually developing lung cancer.

- The researchers worked on improving the method of CT imaging of suspicious lung nodules and found that by including the tissue surrounding lesions, they improved the chance of correctly diagnosing whether an individual has lung cancer.