CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:
RP160776

Project Title:
Rapid Molecular Diagnosis of Lung Cancer Biopsies by Ambient Ionization Mass Spectrometry

Award Mechanism:
High Impact/High Risk

Principal Investigator:
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Entity:
The University of Texas at Austin

Lay Summary:

Evaluation of biopsy material from a suspicious lesion is common screening method to diagnose many cancers. In particular, fine needles aspiration (FNA) techniques are used daily as a minimally invasive procedure to remove a small piece of tissue from a lung lesion. After removed by an interventional radiologist, a cytopathologist performs a variety of staining methods on the tissue and evaluates the cell composition using a microscope. Besides defining if the lesion has cancer cells or not, the cytopathologist strives to characterize the cancer type, as this information can affect the treatment options. Although used for over a hundred years, the results depend on the doctor's skills in determining if a cell is cancerous or not based on its morphology and protein markers. This information can be very challenging to assess rapidly from a small sample, especially as cells of different lung cancer subtypes look very similar. Thus, the results can be subjective and require additional tests and interventions, which are costly and further delay the process. For a patient, waiting a week or more for a diagnosis can be daunting. There is a need to develop new molecular technologies for rapid, exact and comprehensive analysis of lung biopsy tissues. We propose to use an innovative chemical technique to directly analyze FNA biopsies, and provide real time diagnostic molecular information of lung cancers. This new technique is performed on the lung biopsy tissue with no modifications, and has the potential to be employed in a hospital routinely to rapidly screen, diagnose, and characterize tissue. Our interdisciplinary team of researchers believes this innovative technology can be successfully used for in situ diagnosis of small lung tissue samples obtained by FNA biopsies. We will test this hypothesis in our research and hope to substantially improve lung cancer diagnosis. Ultimately, we hope to greatly advance the treatment of lung cancer patients.