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**LTRC Concept Sheets # 08-99-0004 and 08-99-0005**

**MicroRNA Microarray Analysis of Chronic Obstructive Pulmonary Disease**

**ABSTRACT I**

Chronic obstructive pulmonary disease (COPD) is an airway lung disease involving airway obstruction and pulmonary inflammation. Smoking is one of the major risk factors. A novel pathway for gene regulation utilizes non-coding ~22-nucleotide small RNA, microRNAs (miRNAs), which have been implicated in development, cell proliferation and differentiation, apoptosis and lung cancers. However, whether miRNAs are involved in COPD is unknown. We hypothesize that the alteration of miRNAs leads to the changes in the genes that participate in the development of COPD. We have developed and validated an in-house miRNA microarray containing over 200 miRNAs. We will analyze LTRC COPD samples using this miRNA microarray. We will then verify the miRNAs that changed in the lungs of the COPD patients by qPCR. Finally, we will determine the cellular localizations of the selected miRNAs by in situ hybridization. We hope to identify the miRNAs involved in COPD and further study their functions.

**MicroRNA Expression Profiles in Idiopathic Pulmonary Fibrosis**

**ABSTRACT II**

Idiopathic Pulmonary Fibrosis (IPF) is a chronic interstitial lung disease characterized by pulmonary inflammation and fibrosis. The pathogenesis of IPF involves multiple cell-cell interactions and cross-talk of multiple signal transduction pathways. MicroRNA is a non-coding ~22-nucleotide small RNA implicated in many biological processes and diseases. MicroRNAs regulate ~ 1/3 of mRNAs. However, nothing is known regarding the role of miRNAs in IPF. We hypothesize that miRNAs are dys-regulated during the progression of IPF and that these miRNAs regulate genes responsible for the development of IPF. We have previously identified some lung-specific microRNAs using an in-house microRNA microarray containing over 200 miRNAs. Using this miRNA microarray, we will perform microRNA microarray analyses of LTRC IPF samples. The identified miRNAs will be verified by qPCR. The cellular localizations of the selected microRNAs will be determined by in situ hybridization. This pilot study will provide the basis for further functional studies of miRNAs in IPF.