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PRIFILING EXHALED BREATHE CONDENSAES IN EXPOSOMIC STUDIES

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It is well established that polluted air causes and exacerbates pulmonary disease such as chronic obstructive pulmonary disease (COPD), asthma, and sleep apnea. However, the biological mechanisms involved in these conditions is not well understood. The goal of this research is to identify biomarkers from exhaled breath condensate samples obtained from participants with these conditions, and trace biological pathways triggered by pollutants. These EBC samples which have been well preserved and catalogued are being analyzed using gas chromatography mass spectroscopy (GCMS) with solid phase microextraction (SPME) to identify various chemical signatures. Also, we collected air quality measurements for the time periods and geographic locations associated with these participants' residential locations and times of sample collection. The GCMS analysis results and environmental data are then integrated and assimilated to generate high-resolution spatio-temporal records of exposure and chemical signatures of biological mechanisms leveraging the Exposure Health Informatics Ecosystem (<http://prisms.bmi.utah.edu/>). We also will evaluate computational models of pollutant levels in this assimilation effort. Finally, we will review any existing literature for those biomarkers that we find significant from our analysis for each of these respiratory conditions.