# Multiscale Imaging-Based Cluster Analysis of a Cohort of Current Smokers

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Classification of patients with chronic obstructive pulmonary disease (COPD) is usually based on the severity of airflow limitation, e.g. pre- and post- bronchodilator FEV1, which may not reflect the phenotypic heterogeneity nature of the disease. Recently, we have developed a multiscale-imaging based cluster analysis (MICA) and applied it to analyze 248 asthmatics from Severe Asthma Research Program (SARP). MICA yielded four stable imaging clusters which exhibit strong associations with clinical characteristics (1). In this study, we further applied MICA to a cohort of current smokers from the SubPopulations and InteRmediate Outcome Measures in COPD Study (SPIROMICS). We obtained four statistically stable clusters with distinct imaging-based structural and functional alterations. We further demonstrated that these imaging clusters exhibit significant associations with distinct clinical phenotypes used for diagnosis of COPD. Our MICA provides a link between individual and population scales.

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Reference:

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