TMF: Multiple-omic B cell signatures of emphysema in lung tissue

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Project Title: Multiple-omic B cell signatures of emphysema in lung tissue

Abstract: Chronic obstructive pulmonary disease (COPD) is characterized by progressive airflow obstruction accompanied by chronic inflammation and is a major and growing cause of morbidity and mortality worldwide. Although environmental exposures such as cigarette smoking are risk factors, a genetic component is also present. Heterogeneity of COPD is characterized, in part, by the presence of airway inflammation and remodeling and/or emphysematous destruction in the lung. Molecular characterization of emphysema would inform personalized treatments to improve outcomes. We previously identified a COPDassociated module of co-expressed genes in lung tissue enriched for B cell activation, proliferation, aggregation and signaling pathways. This finding was consistent with previously published histologic findings of lymphoid aggregates in severe COPD patients and the relevance of immune pathways in COPD. B cells have a role in emphysemapredominant COPD with findings suggesting a detectable B cell response prior to observed reductions in lung function. However, the specific role of B cells in emphysema is not clear. The central hypothesis of this study is that lung B cell omics are associated with emphysema severity. We further hypothesize that B cell activity mediates the effects of smoking on emphysema.

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