Inter-airway structural heterogeneity interacts with dynamic heterogeneity to determine lung function and flow patterns in both asthmatic and control simulated lungs

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Highlights

- Clustered ventilation defects are a hallmark of asthma observed in imaging studies.
- We present a new model of clustered ventilation defect formation in the lung including interactions between structural and dynamic heterogeneity in a full human lung geometry.
- Differences in structural heterogeneity in asthma significantly alter function and flow patterns.
- Paradoxical contraction/dilation patterns are present at all airway sizes and relate to structural heterogeneity patterns in non-obvious ways.