

# Biophysical approach of the mucociliary function: Mucus rheology and beating coordination

The mucociliary function of the bronchial epithelium ensures the continuous clearance of the respiratory system, which relies on two main elements: mucus and cilia beating coordination.

We perform here a rheological characterization of mucus samples extracted from ALI (Air-liquid interface) cultures of bronchial epithelium. Our approach combines macro- and micro-rheology techniques with the aim of quantifying the mucus viscoelastic properties at different length scales (from the size of bronchial cilia up to the scale on which mucus is transported). This specific methodology allows us to compare samples corresponding to different patient pathologies.

In addition, we will describe our method to quantitatively characterize the coordination between cilia and how density and spatial distribution influences this coordination and consequently the mucus motion, required for the mucociliary clearance.