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Title: Epithelial ciliary beating analysis in chronic airway diseases

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Body: Human bronchial epithelial cells (HBEC) activation and increased mucus production are constant features of epithelium in chronic airway diseases. However, the mechanisms and involvement of mucociliary component are poorly understood in these diseases. We used an in vitro model of bronchial epithelial cell culture in air/liquid interface obtained from bronchial biopsies of asthmatic patients (mild and severe) or COPD patients. We questioned the regulation of mucociliary couple in this system using an original approach combining biology and physics. Methods. HBEC obtained after processing biopsy were expanded on tissue culture-treated plastic and then, were plated on uncoated nucleopore membranes in air-liquid interface for 21 days to obtain a mucociliary phenotype. For each epithelium re-differenciated in vitro, we first measured thickness and ciliary beating frequency (CBF). We used fast videomicroscopy (37°C). The effect of mucus presence on cilia beating was assessed by measuring frequency before and after washes with PBS. Results. Preliminary results are presented in table 1 and are expressed as median (min-max). Conclusion. At present we did not find any major change in the velocity of cilia beating according to the airway diseases in our air-liquid interface system. The contribution of mucus should be better investigated.

Epithelium thickness and Ciliary beating frequency obtained in air-liquid interface model

	Controls (n=2)	Mild Asthmatics (n=5)	Severe Asthmatics (n=4)	COPD (n=3)
Thickness (µm)	43 (33-53)	38 (33-43)	42 (35-50)	51 (45-53)
CBF (before wash) (Hz)	16 (12-20)	17 (15-20)	19 (16-24)	14 (13-21)
CBF (after wash) (Hz)	19 (16-21)	19 (14-21)	19 (17-21)	14 (13-21)