The influence of the storage medium on respiratory ciliary beating

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Introduction: Primary ciliary dyskinesia (PCD) is an heterogenic inherited ciliopathy in which respiratory cilia are stationary or dyskinetic. Digital high-speed videomicroscopy (DHSV) is highly sensitive and specific for PCD diagnosis, but lacks standardization. Various laboratories store respiratory epithelium within different medium before performing DHSV, which may influence ciliary functional analysis (CFA). Indeed, minor variations in pH, osmolarity, oxygen, and in the concentration of vitamins (i.e. Vitamin C and B12) or ions may affect ciliary function.

Aims: To evaluate the influence, on ciliary beating, of the storage of respiratory epithelial samples in a particular medium.

Methods: Ciliated epithelial samples were obtained by brushing the medium nasal turbinate from 5 non-smoking healthy subjects. The samples were divided equally, and conserved either within medium 199 (M199) or RPMI 1640. Beating cilia were recorded using DHSV at 37°C immediately after brushing. CFA was assessed by CBF and the percentage of dyskinesia(%DK).

Results: There was no significant differences in ciliary function between the nasal brushing samples conserved in M199 or in RPMI 1640.

	M199	RPMI 1640	p-value
CBF (Hz)	13.9±1.7	13.7±1.6	0.800
%DK (%)	7.8±10.8	10.9±5.4	0.598

Data are expressed as mean±SD

Conclusions: This pilot study suggests that the choice of the medium used to store ciliated respiratory epithelial samples before and during DHSV may not affect ciliary function. However, larger studies are needed to confirm these preliminary results, notably in pathological conditions.