Quantification and characterization of human lung mesenchymal stem cells

ORAL COMMUNICATION

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BACKGROUND
Mesenchymal stem cells (MSC) have been described in many organs, but their presence, characteristics and function in human lungs (LMSC) is unclear, and their role in chronic obstructive pulmonary disease (COPD) remains elusive.

OBJECTIVES
To identify, isolate and characterize LMSC in non-smokers (NS), smokers with normal lung function (S) and COPD patients.

METHODS
We used fresh lung tissue from individuals undergoing lung resection surgery (mostly because of lung cancer) to isolate LMSC. Cultured LMSC (NS n=5, S n=10, COPD n=23) were characterized using flow cytometry, qPCR, confocal microscopy and functional assays.

RESULTS
In all three groups we identified a group of cells, which we believe, are LMSC since they had phenotypic characteristics similar to those described in bone marrow MSC (including the expression of mesenchymal transcription factors (Oct-4, KLF4)) and were able to differentiate into adipocytes and osteocytes. Their proportion (as determined by flow cytometry (CD90+, CD105+ CD73+)) was similar in the three groups (NS= 0.075%±0.06, S= 0.077%±0.06, COPD=0.102%±0.08). Their tissue localization, proliferation rate and immunomodulatory capacity are currently being investigated.

CONCLUSIONS
We have identified a population of LMSC in lungs from NS, S and COPD patients. Differential characteristics of LMSC across groups are currently being investigated.

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