proliferation (p = 0.0043) compared with LRIG1-negative cells. Similarly, LRIG1-expressing human airway basal cells isolated from endobronchial brush biopsy samples exhibit increased colony-forming capacity (p = 0.0469). Topical application of NTCU to mice recapitulates the development of human pre-invasive and SCLC lesions after 23 weeks. Results show lesions in LRIG1-KO mice to be larger than those of WT animals. Knock down of LRIG1 in cultured human airway basal cells alters cell phenotype, leading to an increased colony-forming efficiency and greater proliferation at cell confluence.

Conclusions LRIG1 has an important role in stem cell homeostasis of the human and murine airway epithelium. Loss of LRIG1 promotes pre-cancerous lesion development in a murine SqCLC mouse model and behaviour of human epithelial cells in culture, indicating a potential target for chemoprevention of SqCLC in humans.

S10 INVESTIGATION OF VESSEL STRUCTURE IN THE VICINITY OF LUNG TUMOURS

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10.1136/thoraxjnl-2016-209333.16

Lung cancer is considered a major cause of cancer death.[1] We are currently developing methods for detection of vessels in lung CT images. The aim of this study was to investigate the number of vessels in areas of unilateral lung tumours and compare with the equivalent contralateral lung with no tumour. Lung CT images were downloaded from the Cancer Imaging Archive wiki.cancerimagingarchive.net/display/Public/LungCT-Diagnosis.[2] Software was written in MATLAB (The MathWorks Inc., USA) in order to display and analyse the DICOM images. Windowing was performed manually in order to clearly display the tumours as well as surrounding vessel like structures. Using the software eight sets of images were analysed; the number of clearly defined vessel like structures directly attached to the tumour were counted and compared with the corresponding region in the contralateral lung with no evidence of tumour; small vessel like structure and branches were not included. The area of the tumour was manually delineated and calculated in terms of pixels. For each set of CT images, one image was used where the tumour size was greatest. In all eight cases the number of clear vessel like structures in the immediate vicinity of the tumour was greater than that in the corresponding area on the contralateral side, mean (standard deviation) of the difference 5 (1.6), there was a significant difference $p < 0.001$ (one sample t test). In addition vessel like structures often appeared brighter on the side of the tumour. The results of this pilot study suggest that the number of clear bright vessel like structures in the immediate vicinity of a lung tumour may be higher than in the corresponding area on the contralateral side. We feel this research merits further study in order to investigate if this approach may help enable early detection of lung tumours.

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Progress in the ITU

S11 DECREASED ANTI-INFLAMMATORY POTENTIAL OF MESENCHYMAL STEM CELLS AFTER PROLONGED IN VITRO EXPANSION WILL IMPACT ON THEIR USE AS A THERAPY FOR ACUTE RESPIRATORY DISTRESS SYNDROME

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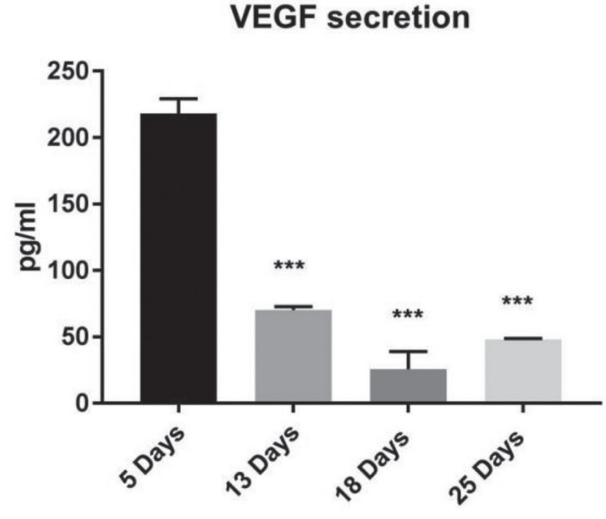
10.1136/thoraxjnl-2016-209333.17

Introduction and objectives Mesenchymal stem cells (MSC) have well-established anti-inflammatory properties and could potentially be used therapeutically in Acute Respiratory Distress Syndrome (ARDS).[1] MSC conditioned medium (MSC-CM) has been found to reproduce the beneficial effects of MSCs.[2] However, the impact of expansion on MSC secretome remains elusive. In the present study we assessed the expression of four potent MSC paracrine factors after prolonged *in vitro* culture, while investigating the effects of passaging on the *in vitro* properties of MSCs.

Methods Human Bone marrow-derived MSCs were expanded *in vitro* in αMEM with 16% FBS. Conditioned medium was collected from each passage and stored at −40°C. Scratch assays were undertaken using A549 cells treated with MSC-CM and control media. Proliferation of A549 cells was assessed via BrdU assay. Gene expression of expanded MSCs was assessed by RT-qPCR. VEGF and Angiopoietin in the MSC-CM were quantified by ELISA.

Results RT-qPCR revealed that MSCs express the anti-inflammatory genes *PTGES2*, *FGF7* and *ANGPT1*. The expression of these genes doubled after 8 days in culture and subsequently decreased. ($P < 0.0005$, one way Anova, n = 2). The secretion of Angiopoietin and VEGF decreased with prolonged expansion (Figure 1). MSC-CM obtained after 8 days of culture induced more efficient wound healing compared to MSC-CM obtained following prolonged expansion ($P < 0.005$, one way Anova, n = 2). However, MSC-CM failed to affect the proliferation of A549 cells.

Conclusion We conclude that MSCs of early passages are more potent angiogenic inducers, while promoting wound healing in



Abstract S11 Figure 1 Levels of secreted VEGF decrease after prolonged *in vitro* culture (*P<0.05, ***P<0.0005, n = 2)

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