

Abstract S87 Table 1

	A Media	BL Media	A CSE	BL CSE	A LPS	BL LPS	A CSE & LPS	BL CSE & LPS
NS IL-8 [pg/ml]	24060±2514	34490±3260	36193±3755	29417±2352	34166±3347	36969±5019	43031±3211*	43890±5257
HS IL-8 [pg/ml]	28728±2422	22903±3500	41908±3269	27995±4233	37298±3052	33298±5856	39952±3131	34095±5634
COPD IL-8 [pg/ml]	32163±2474	43768±8730	24376±2474*	21994±4176*	44092±3247	54604±11363	20866±1564*	27180±4680*
NS IL-6 [pg/ml]	227±32	735±98	253±35	678±106	391±53	633±68	469±48*	714±107
HS IL-6 [pg/ml]	289±48	518±102	285±53	418±86	447±77	487±125	536±55*	884±169*
COPD IL-6 [pg/ml]	432±128	846±235	300±89	728±113	680±139	1012±186	324±43	578±92

IL-8 and IL-6 release from well differentiated bronchial epithelial cell cultures into apical and basolateral compartments after stimulation with PA LPS ± pre-treatment with 5% CSE for 24 h. NS: Non-smoker; HS: Healthy Smoker; A: Apical; BL: Basolateral.

Media: No stimulation; CSE: Stimulation with 5% CSE 24 h; LPS: Stimulation with PA LPS 24 h; CSE & LPS: Pre-treatment with 5% CSE 24 h, stimulation with PA LPS 24 h.

\* Statistically significant difference for soluble mediator release into a given compartment within each study group relative to the equivalent compartment without stimulation;  $p < 0.05$ .

phosphorylation patterns of oncoproteins in small clinical samples. Therefore we developed an exquisitely sensitive capillary isoelectric focusing immunoassay (cIEF) method for discriminating phosphorylated isoforms of ERK and AKT in lung tissue.

**Methods** Participants undergoing curative resection for early stage NSCLC were recruited. Samples from normal lung and tumour tissue were taken shortly after resection and analysed using cIEF.

**Results** Twenty patients were recruited (12 male, 8 female), mean age 67.3 years (SD 7.5), 10 current and 10 former smokers with a mean smoking exposure of 48.4 pack years (SD 24.4). Tumour tissue (9 squamous and 11 adenocarcinoma) was collected and paired macroscopically normal lung that was histologically normal (n=7) or showed emphysema (n=13), graded pathologically as mild (n=7), moderate (n=3) or severe (n=3). The coefficient of variance was 7.6% for ERK and 4.2% for the AKT assay. The limits of detection and quantification were 8ng and 16ng of total protein respectively.

Diphosphorylated ERK (active form) was nearly three-fold higher in emphysematous lung tissue than normal lung tissue ( $p=0.002$ ) and was associated with pathological severity of emphysema. In contrast, diphosphorylated ERK did not differ between paired normal lung and tumour ( $p=0.45$ ) and there was no correlation of ERK status with age, gender, smoking status, tumour site, histology or stage. AKT was significantly more phosphorylated in tumour than matched normal lung. There was a trend for more phosphorylated AKT with poor differentiation but no correlation with tumour histology, size, site or stage of disease. Current smokers had more phosphorylated AKT than ex-smokers. There was no difference in the phosphorylation patterns of AKT according to age, gender or emphysema status.

**Conclusions** We found a strong relationship between diphosphorylated ERK and emphysema. By contrast, AKT phosphostatus was associated with lung cancer but not with emphysema. The requirement for just nanograms of protein defines the potential of this technique for determining the phosphostatus of oncogenic signalling proteins in tiny clinical samples.

## S89 EPIHELIAL MESENCHYMAL TRANSITION (EMT) IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD) AIRWAYS IS ATTENUATED BY INHALED CORTICOSTEROIDS (ICS)

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**Introduction and Objectives** We recently reported<sup>1,2</sup> that EMT is active in the airways of COPD patients; in this process epithelial cells change shape and become motile, then digest through the reticular basement membrane (Rbm) which becomes fragmented and transition to a mesenchymal fibroblast-like cell. We also demonstrated that the Rbm is hyper-vascular, a combined picture specifically suggesting active EMT-type-III, which is a dangerous, pre-malignant condition. This may well be the link between COPD and lung cancer. In this study, we have assessed the effects of ICS on markers of EMT in endobronchial biopsies (ebb) in COPD.

**Methods** A double-blinded, randomised, placebo-controlled study assessed the effects of inhaled fluticasone propionate (FP: 500µg twice daily) on EMT in 34 COPD patients. Ebb were assessed for EMT related Rbm fragmentation (core structural marker) and immunostained for the EMT signatures S100A4 (a fibroblast epitope), matrix-metalloproteinase-9 (MMP-9) and the epithelial activation marker, epidermal growth factor receptor (EGFR).

**Results** Table 1.

**Conclusions** This is the first study to report the positive effects of ICS on EMT markers in COPD. This may be the mechanistic link between ICS and its reported preventive action against smoking-related lung cancer in COPD.

## References

1. Sohal SS, et al. *Respirology* 2010, **15**(6):930–938.
2. Sohal SS, et al. *Respir Res* 2011, **12**(1):130.

## Improving lung cancer survival

### S90 THE NATIONAL LUNG CANCER AUDIT – NO EVIDENCE OF A “SEVEN-YEAR ITCH”

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**Introduction** The National Lung Cancer Audit, now in its 7<sup>th</sup> year, is run jointly by the Royal College of Physicians and The Information Centre for health and social care, and is commissioned by the Healthcare Quality Improvement Partnership (HQIP). Its development was driven by the realisation that lung cancer outcomes vary widely across the UK and are poor compared to other western