EB were stained for: eosinophils (congo red), neutrophils (neutrophil elastase), mast cells (mast cell tryptase); and reticulin basement membrane (RBM) thickness, epithelial shedding and volume fraction (Vv) of smooth muscle.

Results See Abstract S88 Table 1. Children with SA had significantly increased BAL and submucosal eosinophils compared to controls. There were no significant group differences in submucosal mast cells, but the presence of mast cells within smooth muscle exhibited a non-significant trend to be increased in SA and MA. Children with mast cells within smooth muscle were more likely to have PAL (post bronchodilator, post steroid trial FEV1<80% predicted) (p<0.05). The Vv of subepithelial tissue occupied by airway smooth muscle (ASM) was only increased in SA.

Abstract S88 Table 1  Airway inflammation and remodelling in severe, mild/moderate asthma and non asthmatic control subjects

<table>
<thead>
<tr>
<th></th>
<th>Severe asthma (n=53)</th>
<th>Mild/moderate asthma (n=72)</th>
<th>Control (n=15)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAL eosinophils</td>
<td>2.7 (1–51)</td>
<td>0.7 (0–27.7)</td>
<td>0 (0–5.7)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>BAL neutrophils</td>
<td>3.3 (0.3–73.7)</td>
<td>1.7 (0–73)</td>
<td>2.7 (0.6–14)</td>
<td>NS</td>
</tr>
<tr>
<td>Mucosal eosinophils (mm$^2$)</td>
<td>11.2 (0–209.3)</td>
<td>3.7 (0–14.5)</td>
<td>0 (0–25.1)</td>
<td>0.01</td>
</tr>
<tr>
<td>Mucosal neutrophils (mm$^2$)</td>
<td>9.8 (0–125.6)</td>
<td>11.4 (0–22.2)</td>
<td>1.2 (0–58.3)</td>
<td>NS</td>
</tr>
<tr>
<td>Mucosal mast cells (mm$^2$)</td>
<td>45.7 (0–185)</td>
<td>63.1 (9.2–79.7)</td>
<td>60.5 (0–165.6)</td>
<td>NS</td>
</tr>
<tr>
<td>Muscle mast cells (mm$^2$)</td>
<td>12.3 (0–299)</td>
<td>18.3 (7–72.8)</td>
<td>0 (0–50)</td>
<td>NS</td>
</tr>
<tr>
<td>Vv (sm/subepithelium)</td>
<td>0.20 (0–0.65)</td>
<td>0.06 (0–0.3)</td>
<td>0.03 (0–0.16)</td>
<td>0.002</td>
</tr>
</tbody>
</table>

Values are median (range). All highlighted p values denote difference between severe asthma and controls. BAL, bronchoalveolar lavage; RBM, reticular basement membrane; sm, smooth muscle; Vv, volume fraction of airway smooth muscle indexed to subepithelium.

Conclusions Children with SA have increased luminal and submucosal eosinophilia. However, in contrast to reports in adults of AHR being associated with mast cell myositis, we have found severe asthmatic children with mast cell myositis were more likely to have PAL. Mast cell myositis may be a feature of severe asthma in children.
Post-heating histology was obtained. This study demonstrates the potential of SPION to act as an imaging agent and cancer therapy. SPION-labelled MSCs can be imaged in vivo in very low cell numbers. We have demonstrated that the application of an alternating magnetic field causes a temperature rise in these cells, both in vitro and in vivo. In the future, we will optimise SPION as an imaging and hyperthermia agent, for the targeted treatment of lung metastases.

Acknowledgements We are grateful for the support of the Medical Research Council.

Homocysteine levels in non-small cell lung cancer

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Plasma homocysteine level is the most sensitive marker of sub-clinical folate deficiency. Elevated levels of homocysteine have been associated with several pathologies, particularly vascular and cardiac disease. Patients with lung cancer are frequently elderly and may have insufficient intake of folate. Sub-clinical folate deficiency may lead to increased morbidity during chemotherapy and radiotherapy, and possibly reduced response rates to both treatment modalities. We have measured plasma homocysteine levels in 460 patients with a diagnosis of non-small cell lung cancer who were referred to our lung cancer unit between 2005 and 2009. Two hundred and fifty-six patients were male, 204 were female. The median age was 71. 22% of patients were PS 0-1, 35% PS2 and 43% PS3. The local laboratory reference range for homocysteine is ≤15 μmol/l. 48% of patients had elevated plasma levels of homocysteine at diagnosis. In 35% the level was between 15.1 and 25 μmol/l, and in 8% the homocysteine level was greater than 25 μmol/l. Patients with elevated plasma homocysteine levels had inferior median and 1 year survival rates, both for stage III disease (464 vs 356 days ms, 1 year survival 65% vs 47%) and stage IV disease (212 vs 190 days ms, 1 year 30% vs 21%). The finding of elevated homocysteine levels in 45% of newly diagnosed patients with non-small cell lung cancer is of potentially profound significance, as this implies that there could be a possible therapeutic benefit from folate and B12 supplementation before and during treatment for this group of patients with non-small cell lung cancer.

Abstract S91 Figure 1 VDR stains brown in (A) bronchial epithelium (B) adenocarcinoma. Tissue in all bar (D) is from the same individual. (D) shows both epithelium and cancer tissue. Similar results were seen in two patients with squamous carcinomas.
S89 Bimodal iron oxide nanoparticles for hyperthermia therapy and MR imaging in cancer
K L Parcell, T L Kalber, S Walker-Samuel, P Southern, Q A Pankhurst, M F Lythgoe and S M Janes

Thorax 2010 65: A41-A42
doi: 10.1136/thx.2010.150938.40

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