(n = 212); of these, 10 (5%) participants were sensitised to mouse proteins. Prevalence of sensitisation was 3.5% in IVC only facilities and 6.3% in open cage/mixed facilities. Although numbers are small, a history of atopy to common aeroallergens and the site at which people worked appears to be associated with risk of sensitisation. Reporting of symptoms of laboratory animal allergy was as anticipated. (Table 1).

Conclusion The results from the SPIRAL study will be used to develop an evidence-based "Code of best working practices" for facilities using IVC systems, nationally and further afield, with the overall goal of significantly reducing the incidence of LAA.

P57 IMMUNE MECHANISMS IN PIGEON FANCIER'S LUNG

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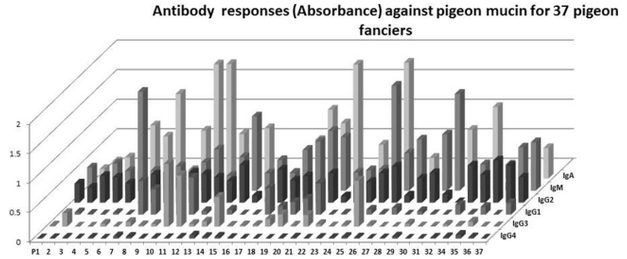
Background Pigeon fanciers have a 1 in 10 risk of developing Pigeon Fancier's Lung (PFL), a form of hypersensitivity pneumonitis due to inhaled pigeon antigens. This manifests as acute episodes of breathlessness, cough and fever after antigen exposure, which may progress to chronic dyspnoea and lung fibrosis. The precise disease mechanisms are unclear but both antibody and T cell responses specific for pigeon antigens are implicated. We wish to better understand immune responses against pigeon antigens in PFL to give new insight into the disease mechanisms and provide disease markers.

Methods We studied the antibody and cellular immune response in fanciers attending pigeon shows. 77 completed a questionnaire of symptoms, performed spirometry and gave a blood sample, 32 of whom had symptoms of acute PFL. Peripheral Blood Mononuclear Cells and serum were extracted from the blood, and T cell and antibody responses were measured against pigeon serum and mucin using in-house well-characterised assays (ELISA and ELIspot, respectively), as well as flow cytometry and multiplex cytokine assays. These provided quantitative outputs of specific antibody titre and reactive T cells per million PBMC, validated using positive controls. Correlations between immune responses and disease symptoms were analysed.

Results All fanciers examined had significant antibody and T cell responses against pigeon serum and/or pigeon mucin antigen. A range of antibody avidities and isotypes were observed (Figure 1; n = 37; 2012 cohort), but only IgA appeared to correlate with symptoms score (p = 0.012). T cell responses to pigeon serum were measured in the form of proliferating cells positive for lung-homing receptors (alpha4beta1 integrin), and secreting gamma-interferon and large amounts of anti-inflammatory interleukin 10; but did not correlate with symptoms.



Abstract P57 Figure 1

Conclusions Pigeon fanciers have high levels of antigen exposure and demonstrate intense antibody and cellular immune responses, but these correlate minimally with clinical symptoms. The pathogenesis of PFL is complex and may involve an inflammatory cell-antibody axis.

P58 CARRY OUT OF ANIMAL ALLERGENS FROM ANIMAL FACILITY ON SKIN OF LABORATORY ANIMAL WORKERS

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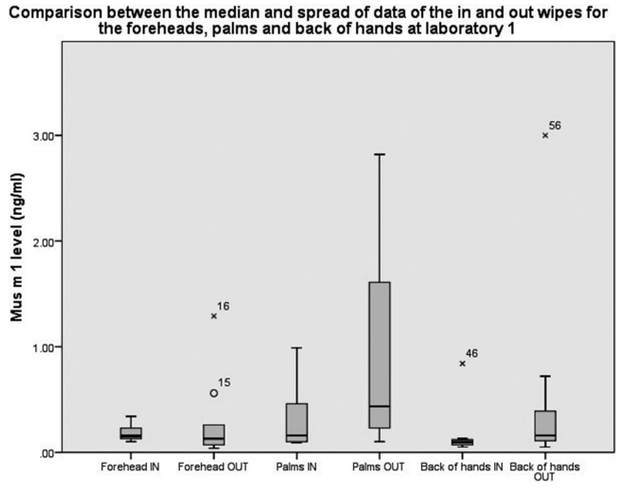
Introduction There are at least 12,000 laboratory animal workers in the UK who are at risk of developing an IgE-associated respiratory allergy to airborne animal proteins. There has been a drive to reduce animal allergen levels in animal facilities, however recent studies have suggested that laboratory workers may also transfer animal allergens outside of the animal facility to their offices, laboratories and indeed their homes. Among Scottish technicians Mus m 1 was detected on hands, shoes, car steering wheels and domestic door handles after leaving work (S. Semple – personal communication). Krop *et al*. detected significantly higher levels of mouse allergen in mattresses from the homes of laboratory animal workers than those from non-exposed controls suggesting carry out of allergen from work to home. These observations may have significant clinical relevance; in Poland, children of laboratory animal workers had a higher prevalence of sensitisation to mouse than did the children of parents in other occupations.

The aim of our study was to evaluate whether mouse allergen is transferred out of the animal facility on the skin of workers.

Methods We examined dermal wipes taken from forehead, palms and back of hands of both laboratory animal workers and non-exposed workers, when they entered the facility in the morning and again when they were ready to depart at the end of the day. Mus m 1 was extracted from the wipes and levels quantified using an ELISA (Indoor Biotechnology).

Results Mus m 1 levels were significantly higher in the dermal wipes taken at the end of the day compared to those taken in the morning ($p < 0.05$), in the laboratory animal workers but not in the non-exposed controls (Figure 1).



Abstract P58 Figure 1

Conclusions In summary, our study demonstrates that laboratory animal workers carry out animal allergen on their skin when they leave the animal facility at the end of the day. The implication of these findings will be considered in the development of safe working practices in prevention of laboratory animal allergy within the context of the SPIRAL study.

P59 TO DETERMINE MUS M 1 PERSONAL EXPOSURE IN LABORATORY ANIMAL WORKERS IN FACILITIES WHERE MICE ARE HOUSED IN OPEN CAGES AND INDIVIDUALLY VENTILATED CAGES

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10.1136/thoraxjnl-2015-207770.196

Background Laboratory animal workers face the risk of developing an IgE-associated respiratory allergy to airborne proteins, such as Mus m 1 (mouse urinary protein). Approximately 15% of exposed employees will develop IgE sensitisation and 10% clinically apparent disease. We have recently embarked on a large study called SPIRAL (Safe Practice In Reduction of Allergy in Laboratories) to gain a greater understanding of laboratory animal allergy (LAA) and to determine whether we can devise a code of safe practice to prevent, as far as possible, the future occurrence of LAA.
Aim To determine personal exposure to Mus m 1 within animal facilities where mice are housed exclusively in open cages and exclusively in individually ventilated cages (IVC).
Methods Selected employees wore Casella Apex pumps (2 L/min) during their full shifts to collect inhalable particulate onto fluoropore membrane (1 μm), 25 mm filters using IOM sampling heads.82 filters from an IVC facility and 56 filters from an open cage facility were analysed for Mus m 1 using a commercial sandwich enzyme linked immunoassay (Indoor Biotechnology).
Results The range of Mus m 1 levels within the IVC facility was 0.00–66.33 ng/m^3 and in the open cage facility was 3.89–305.59 ng/m^3. 11 (13%) of samples from the IVC facility and 50 (89%) of samples from the open cage facility had a Mus m 1 exposure level greater than 5 ng/m^3. Additionally, there was substantial variation when task specific sampling was carried out over short periods of time compared with full shift sampling. Further analyses will allow us to identify which tasks were associated with highest levels of exposures.
Conclusions The majority of samples from the open cage facility were above 5 ng/m^3, a figure previously suggested to limit or reduce incidence of LAA. Although use of IVCs has been shown to reduce exposure to Mus m 1, we found several samples above 5 ng/m^3. Exposure to high allergen levels will be influenced by cage type, variation in individual working practices and carrying out of specific "high-risk" tasks; some of these factors may be modifiable and these results may be used to change practice.

P60 UPTAKE AND QUALITY OF HEALTH SURVEILLANCE FOR OCCUPATIONAL ASTHMA IN THE UK

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Introduction Statutory periodic health surveillance (HS) of workers can identify early cases of occupational asthma. Information about its uptake in the UK, and its content when carried out, are lacking.
Methods A telephone survey of employers, and their occupational health professionals, was carried out in three sectors with the potential for producing exposures, which may result in the development of occupational asthma (bakeries, wood working, motor vehicle repair).
Results 457 organisations participated (31% response rate); 77% employed less than 10 people, 17% between 10 and 50 and 6% more than 50. Risk assessments were common (67%) and 14% carried out any form of occupational asthma HS, rising to 19% if only organisations reporting asthma hazards and risks were considered. HS was carried out by both in-house (31%) and external providers (69%). Organisational policies were often used to define surveillance approaches (80%), but shared with the occupational health provider only in one third of cases.

Occupational health providers described considerable variation in practice, with differing approaches seen for information sharing and workplace visits. Record keeping was universal, but worker-held records were not reported. Health surveillance tools, such as a questionnaire, were generally developed in-house. Lung function was commonly measured, but only limited interpretation was evident. The referral of workers to local specialist respiratory services was variable.
Conclusions This study has provided new insights into the real world of health surveillance for occupational asthma in the UK. We consider that future work could and should define more practical, evidence based and simple approaches to HS, by working with the end users to develop interventions that meet their needs. This will ensure maximal uptake of high quality HS approaches and consistency.

P61 RESPIRATORY ILL HEALTH IN THE SILICA EXPOSED BRICK MANUFACTURING SECTOR

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10.1136/thoraxjnl-2015-207770.198

Introduction Exposure at work to inhaled respirable crystalline silica (RCS) has previously been linked with silicosis, tuberculosis, lung cancer and COPD. Whilst the risk of developing silicosis is largely a function of cumulative lifetime RCS exposures, current workplace exposures contribute to this risk.
Methods A cross sectional GB based workplace study of brick manufacturers was carried out, in order to identify a subsequent longitudinal cohort. Participating worksites were using silica to make bricks for various uses. Consenting workers were asked to complete an interviewer led questionnaire, undergo lung function testing and complete a full occupational history including details of lifetime exposure to RCS. Consenting workers had a PA Chest Radiograph using a mobile facility, and levels of RCS exposure in the personal breathing zone were taken.
Results 189 workers took part, with a mean age of 45.9 years and 22 years median (range 0.08–47) years worked overall in industry. Three had radiological evidence of silicosis (ILO standards used; 2 definite and one probable case). Respiratory symptoms were common; for example 14.3% reported cough, 21.2% wheeze in the last 12 months, 14.3% reported ever having asthma. 13.2% reported at least one work related respiratory