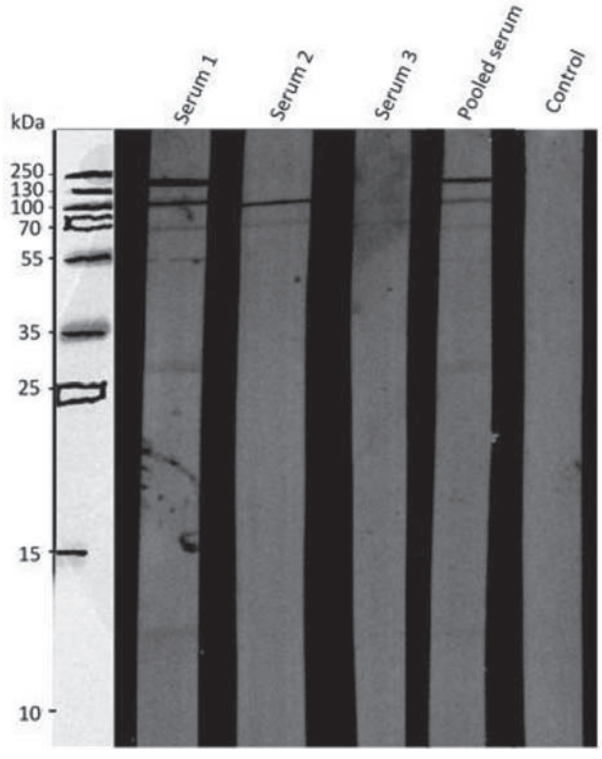
Fruit flies to footballers

S102 IDENTIFICATION OF ALLERGENS PRESENT IN DROSOPHILA MELANOGASTER USING A SERUM IMMUNOBLOTTING METHOD

M Brian, D Jarvis, P Burney, P Cullinan, M Jones. *Population Health and Occupational Disease, National Heart and Lung Institute, Imperial College London, London, UK*

10.1136/thoraxjnl-2017-210983.108

Background *Drosophila melanogaster*, otherwise known as the fruit fly is commonly used in laboratory animal research. We have reported (Jones, Blair *et al*. 2017) that laboratory workers (n=286) exposed to fruit flies have an overall sensitisation prevalence of 6%, based on measuring allergen-specific IgE by radioallergosorbent test to a whole fruit fly extract. Although IgE binding to fruit fly extract was detected, the allergenic proteins responsible for IgE binding have not been identified.
Objective To identify allergenic proteins from a fruit fly extract
Methods Fruit flies were collected from the workplace, extracted overnight in 0.01 mol/L ammonium carbonate at 4°C, dialysed against distilled water and lyophilised. SDS-PAGE was used to separate 150 µg of the extract according to protein molecular weight. Extracted proteins binding to serum specific IgE were detected with Western blotting, using 50 µl of sera from fruit fly sensitised workers (n=3). An alkaline phosphatase conjugated mouse anti-human IgE secondary antibody and NBT/BCIP chromogenic substrate were used in detection. Images were acquired with a ChemiDoc MP and the molecular weight of allergenic proteins determined with a 10–250 kDa prestained protein ladder (ThermoScientific) on ImageLab software (v5.2.1).
Results From the fruit fly extract, six distinct proteins binding to serum specific IgE were observed (figure 1). In three sensitised workers, IgE binding to proteins with molecular weights of ~107 and 76 kDa was observed. For one individual, IgE binding was present to an additional four proteins from the fruit fly extract, with molecular weights of ~183, 54, 28 and 12 kDa. In a control blot, we did not observe any non-specific binding to the fruit fly extract.
Conclusions There are at least six distinct proteins from a fruit fly extract with IgE binding properties of an allergen. Currently, these proteins are not characterised as allergens in protein databases. We will carry out further proteomic testing to characterise these unknown allergens.



Abstract S102 Figure 1 Western blot detection of serum specific IgE binding proteins from l50µg of fruit fly extract. 50 µl of three individual sera, an alkaline phosphatase conjugated mouse anti-human IgE secondary antibody and NBT/BCIP chromogenic substrate were used to detect proteins. Blots were also performed with pooled sera from the three individuals and with no sera (control).

S103 OCCUPATIONAL ALLERGY TO FRUIT FLIES (DROSOPHILA MELANOGASTER) IN LABORATORY WORKERS

[1]M Jones, [2]S Blair, [1]S MacNeill, [1]J Welch, [1]A Hole, [3]P Baxter, [1]P Cullinan. *[1]Imperial College, London, UK; [2]Cambridge University Hospital NHS Foundation Trust, Cambridge, UK; [3]University of Cambridge, Cambridge, UK*

10.1136/thoraxjnl-2017-210983.109

Introduction and Objectives Drosophila melanogaster (the 'fruit fly') is commonly used in genetic research, but there is only one earlier report of immunoglobulin E-associated allergy in exposed workers. Four newly identified cases prompted us to examine the extent of this problem in a university laboratory. Our aim was to determine the prevalence and determinants of sensitisation to fruit flies in a population of exposed workers.
Methods In a cross sectional study we surveyed two hundred and eighty six employees working in a department carrying out research involving D. melanogaster. Sensitisation was assessed by specific IgE measurement in serum using radioallergosorbent assay (RAST) and examined in relation to work-related symptoms and to estimated exposure to fruit flies.
Results The overall prevalence of specific sensitisation was 6% with a clear relationship to increasing frequency/intensity of exposure (p trend <0.001). Work-related eye/nose, chest or skin symptoms were reported by substantial proportions of participants but for most of these there was no evidence of specific sensitisation to fruit fly. The overall prevalence of any work related symptoms and sensitisation was 2.4%, rising to 7.1% in those working in high exposure groups.
Conclusions We were able to demonstrate, for the first time, a clear exposure-response relationship between fruit fly exposure and specific sensitisation. Facilities housing fruit flies should carefully consider methods to reduce exposure levels in the workplace.

S104 INVESTIGATING THE DIAGNOSTIC PERFORMANCE OF SPECIFIC IMMUNOLOGICAL TESTS IN OCCUPATIONAL ASTHMA

D Fernandes, J Cannon, B Fitzgerald, J Welch, M Jones, P Cullinan, J Szram. *Imperial College London, London, UK*

10.1136/thoraxjnl-2017-210983.110

The detection (or otherwise) of specific IgE sensitisation is an important tool in the investigation of employees with potential