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Title: Characterizing T cell responses associated with hypersensitivity pneumonitis in pigeon fanciers

Dr. A. 30507 Jozwik stephen.todryk@northumbria.ac.uk¹, Dr. Nirupma 30508 Kakkar n.kakkar@northumbria.ac.uk MD¹, Dr. O. 30509 Sparagano stephen.todryk@northumbria.ac.uk¹, Dr. Stephen 30510 Burke Stephen.Bourke@nuth.nhs.uk MD², Dr. Charles 30511 McSharry charles.mcsharry@glasgow.ac.uk³ and Dr. Stephen 30512 Todryk stephen.todryk@northumbria.ac.uk¹.¹ Biomedical Sciences, Northumbria University, Newcastle upon Tyne, United Kingdom ;² Respiratory Medicine, Royal Victoria Infirmary, Newcastle upon Tyne, United Kingdom and³ Immunology, Glasgow University, Glasgow, United Kingdom .

Body: Background: Around 10% of pigeon fanciers are affected by a form of hypersensitivity pneumonitis known as pigeon fanciers' lung (PFL). PFL is an aberrant inflammatory immune response to dust particles that contain pigeon antigens, inhaled during pigeon husbandry, and manifests in fever and dyspnoea. A lymphocytic infiltrate has been observed in lung biopsies and bronchoalveolar lavage as well as Th1 cytokines. However, little is known about the implicated pathogenic T cells and whether a systemic response can be measured that indicates disease presence or severity. Methods: Disease history and blood samples were taken from 72 pigeon fanciers at a local pigeon show, 36.1% of whom had PFL. Effector T cell responses were examined by ELISpot. Results: All pigeon fanciers showed an Interferon (IFN)gamma response against antigens in pigeon serum regardless of possessing PFL, and there was no difference in magnitude of response between the groups. No pigeon-specific IL-4, IL-5 or IL-17 ELISpot responses could be detected in any individual. CFSE dilution demonstrated proliferation of CD4 cells in response to pigeon antigen that also possessed CD49d, a potential lung-homing integrin. Interestingly, the IFNg ELISpot response could not be inhibited by anti-MHC class II antibody. Conclusion: These findings show that an unconventional T cell response is generated in conjunction with pulmonary exposure to pigeon antigens that may be necessary but not sufficient to cause PFL disease, and so further analysis of these cells is warranted.