

European Respiratory Society Annual Congress 2013

Abstract Number: 1845

Publication Number: P3152

Abstract Group: 5.3. Allergy and Immunology

Keyword 1: Asthma - mechanism **Keyword 2:** Immunology **Keyword 3:** No keyword

Title: Comprehensive characterisation of T helper cells, cytotoxic T cells and novel invariant T cell phenotypes in human asthma

Dr. Timothy 15081 Hinks t.hinks@soton.ac.uk MD ¹, Dr. Karl 15088 Staples k.staples@soton.ac.uk ¹, Dr. Salah 15089 Mansour s.mansour@soton.ac.uk ¹, Mrs. Caroline 15090 Smith caroline.smith@uhs.nhs.uk ¹, Mr. Jon 15091 Ward j.a.ward@soton.ac.uk ¹, Prof. Peter 15096 Howarth p.h.howarth@soton.ac.uk ¹, Prof. Stephan 15097 Gadola s.gadola@soton.ac.uk ¹ and Prof. Ratko 15098 Djukanovic rd1@soton.ac.uk ². ¹ Clinical and Experimental Sciences, Faculty of Medicine, University of Southampton, Southampton, Hampshire, United Kingdom, SO16 6YD and ² NIHR Southampton Respiratory Biomedical Research Unit, Southampton Centre for Biomedical Research, University of Southampton, Southampton, Hampshire, United Kingdom, SO16 6YD .

Body: Introduction The relative roles of various T cell subsets in airways inflammation have not been fully elucidated. Mucosal associated invariant T (MAIT) cells are novel innate-like T-cells which express CD161 and an invariant TCR α chain (V α 7.2-J α 33) and recognise the highly conserved restriction molecule MR1. Aims To assess the relative roles of Th17, Th1, Th2, Treg, $\gamma\delta$ T cells, CD8+ Tc1 and Tc2 cells in asthma, and to investigate the potential relevance of MAIT cells. Methods 84 subjects underwent detailed clinical phenotyping. PBMC, sputum, lung lavage and biopsies were phenotyped by flow-cytometry, RT-qPCR, and ELISA. Results Th17 cell frequencies did not differ between health and any asthma. Th2 cell frequencies were elevated in asthma in BAL and biopsies. BAL Treg frequencies were lower in severe asthma. Tissue Tc2 were increased in eosinophilic disease, nasal polyposis and smokers. Th2 cytokines were increased in asthma in sputum and BAL. IL-17 was elevated only in BAL in steroid-naïve, older, mild asthmatics. Frequencies of V α 7.2+CD161+ (MAIT) cells in blood were lower in asthma than health and correlated with severity in blood and sputum. This deficiency was specific to MAIT cells, was not related to age, but was exacerbated by 7 days oral steroids. MAIT frequencies correlated with serum vitamin D. MAIT cells were cloned and were heterogeneous in expression of TNF α , IL-17, IFN γ and IL-13. Conclusions A role for Th17 cells in asthma is not supported by these data. High BAL IL-17 levels in mild asthma may have a different cellular source. We describe a novel finding of deficient MAIT cells in severe asthma, whose role in disease remains to be elucidated.