

Mechanisms and treatment of neutrophil accumulation in obstructive airways disease

The obstructive airway diseases COPD and asthma are now major health issues for Australia's ageing population. Both asthma and COPD are characterised by inflammation of the airways. The role of airway inflammation in obstructive airway disease of older people is poorly understood. It is likely to be important but also different to younger people because of life-long exposures to particulates such as cigarette smoke or other immune stimuli such as infections. Neutrophils are a key cell present in the airways playing an important role in defence, in patients with COPD and a sub-group of patients with asthma, neutrophils are elevated and persist in the airways.

During this fellowship I will undertake projects that will investigate inflammation in older people with obstructive airways disease and in particular establish the role of the innate immune response in these participants. We propose that alterations in the innate immune system potentiate an exaggerated neutrophil effector response which is observed in COPD and neutrophilic asthma.

This project will significantly extend our understanding of obstructive airway disease. In particular it will determine the role of innate immunity in the persistence of neutrophilic inflammation. Part of this research will also examine the use of an antibiotic as a treatment for neutrophilic bronchitis in older people. We will examine how the addition of this therapy to standard anti-inflammatory treatments will influence airway inflammation and innate immune receptor expression. The results will be of great importance to understanding disease mechanisms in obstructive airway disease and may lead to improvements in quality of life and new directions for therapeutic research.