

(BBSRC CASE DTP) Investigating new pathways involved in lung immunity

Deadline Friday, November 17, 2017

Project Description

Inflammation is the response of the body to challenges like tissue injury and infection. Maintaining a good inflammatory response is key to achieve repair and restore body's homeostasis. As we age the ability of our body to respond to such challenges is impaired leading to altered inflammatory responses and disease. One system where this is particularly true is the lung where aging leads to an alteration of lung homeostasis that leads to pulmonary diseases. Among these pathologies is COPD (Chronic Obstructive Pulmonary Disorder), a pathology characterized by chronic pan-airway and systemic inflammation, interrupted by intermittent episodes of exacerbation. Understanding the mechanisms that maintain inflammatory homeostasis in the lung and how these are altered during aging is necessary in order to provide optimal care to our aging population.

Recently, an intrinsic connection between complement-metabolism-inflammasome has been described. The complement has key roles in innate and adaptive responses. In fact, its levels are increased during aging and play a key part in the exaggerated inflammatory response found in COPD. Similarly altered inflammasome responses and changes in metabolism have also been linked to aging. However, how these three components interact with each other and how aberration of these interactions alters lung homeostasis eventually leading to pulmonary disease is not known.

Here we hypothesise that metabolic changes induced by complement activation lead to inflammasome activation in human lung macrophages and that this is altered during aging.

This PhD will identify new ways by which complement controls cytokine release during inflammation. Better understanding of the mechanisms underlying complement mediated inflammasome activation and metabolic changes will provide new knowledge on the aging process and that will advance the development of interventions to improve health and wellbeing of the aging population. During this project the student will develop lab skills such as cell culture of primary cells, from blood and lung tissue, Flow Cytometry, quantitative PCR, western blot, imaging approaches, protein-protein interactions and protein modifications and metabolomics.

We are looking for a talented, motivated and enthusiastic candidate to join our team. This is an exciting collaborative project between inflammasome and lung inflammation experts from the Manchester Collaborative Centre of Inflammation Research (MCCIR) and complement experts from the Complement, Cytokine and Chemokine Discovery Performance Unit of GlaxoSmithKline (UK). A unique opportunity to develop research skills in both an academic and industrial environment.

For more information about this project please contact Gloria Lopez-Castejon at Gloria.lopez-castejon@manchester.ac.uk.

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<https://www.research.manchester.ac.uk/portal/David.Brough.html>

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