AAIR Charity
ASTHMA, ALLERGY & INFLAMMATION RESEARCH

Research Award:

The role of PI3 Kinases during human rhinovirus infection in asthma

Awarded to: Dr Cornelia Blume Amount: £9,157 (March 2020 – March 2022)

Lay summary

The common cold is a frequent trigger of asthma exacerbations. It is still not clear why common cold viruses cause exacerbations in asthmatic individuals. One approach to understand this is to characterise the responses of virus-infected cells and compare these between non-asthmatic and asthmatic subjects. The cells lining the airways are cultured in the laboratory using specialised solutions that maintain the cell functions. However, these solutions cause some changes to the cultured cells compared to the cells directly in the human lung. My research showed that the content of poly-unsaturated fatty acids, commonly referred to as fish oils, is reduced in the cultured cells. By optimising the culture conditions, I restored these changes in cultured cells. Importantly, this changed their response to virus infection. I identified differences between cells obtained from non-asthmatic and asthmatic individuals. I found that a signalling pathway that relies fish oil components is changed in cultures from asthmatic individuals. The support of AAIR in this project contributed to published manuscript and another is in preparation. Data from this project are used as preliminary data for external grant applications. The support of AAIR also contributed to my career development enabling me to secure a lectureship position.

Some data obtained during this project were included in the following publication acknowledging AAIR:
Blume C, Jackson CL, Spalluto CM, Legebeke J, Nazlamova L, Conforti F, Perotin-Collard J-M, Frank M, Crispin M, Coles J, Thompson J, Ridley RA, Dean LSN, Loxham M, Azim A, Tariq K, Johnston D, Skipp PJ, Djukanovic R, Baralle D, McCormick C, Davies DE, Lucas JS, Wheway G, Mennella V. A novel ACE2 isoform is expressed in human respiratory epithelia and is upregulated in response to interferons and RNA respiratory virus infection. Nature Genetics 53, 205-214(2021). https://doi.org/10.1038/s41588-020-00759-x

A further manuscript is currently in preparation. Results from this grant are/will be included in external grant applications as preliminary data (Asthma UK, submitted March 2022, pending, AMS Springboard Award 2022: deadline 16th of June 2022).