

## Research Award:

# Investigating whether a species-dependent rhinovirus response in infected cells might be linked to respiratory disease outcome.

**Awarded to:** Christopher McCormick and D. Davies **Amount:** £9,968

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### Lay summary

Rhinoviruses cause the common cold. While rhinovirus infection is a minor inconvenience for most people, in individuals with asthma catching a cold can be life threatening. Rhinovirus produce two types of enzymes called proteases. It is known that the activity of one of the two proteases varies between different strains of rhinovirus, and it is also known that some strains are more pathogenic (i.e. cause more illness) than others. We suspect that variation in pathogenicity may be linked to variation in protease activity. If correct, understanding how variation in protease activity alters an infected cell response could give us important insight into what is happening in the lungs of individuals with rhinovirus-induced severe asthma exacerbation.

Work over the last year has focussed on developing a novel system to look at how the rhinovirus proteases shut down the ability of the infected cell to express new genes, essentially preventing the infected cell fighting back. Using this system, we find that proteases from one of the three rhinovirus species (species A) more rapidly shuts down new gene expression compared to the other two species (species B and C). We also find that this ability to quickly shut down new gene expression is exclusively due to one of the two rhinovirus proteases, with the other protease playing no role. Interestingly, species A has been reported in some clinical studies to be more pathogenic, lending credence to our hypothesis that variation in protease activity could play a role in respiratory disease.

AAIR funding has covered all lab reagents costs associated with this project and helped pay for someone to be in the lab for 6 months, which was essential to get the work up and running. The findings of this study are being written up for publication, after which time applications for further grant funding will be submitted to continue this work.

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