Cell component involved in triggering cat allergy

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(PhysOrg.com) -- A breakthrough by scientists at The University of Nottingham could provide hope for any allergy sufferers who have ever had to choose between their health and their household pet.

The team of immunologists led by Drs Ghaem-Maghami and Martinez-Pomares in the University's School of Molecular Medical Sciences, and funded by the charity Asthma UK, have identified a cell component which plays a key role in triggering allergic responses to cat dander.

The discovery furthers our understanding of how the body's immune system identifies and reacts to allergens, which could pave the way in developing new ways of treating allergies.

The development is especially good news for the millions of people with asthma whose condition is often worsened by their allergy to airborne allergens from cat dander or house dust mite. Cat dander consists of

microscopic pieces of cat skin which easily become airborne.

Dr. Amir Ghaem-Maghami said: “There has been a sharp increase in the prevalence of allergies over the past few decades and allergic asthma among children has reached epidemic proportions in many industrialised countries, including the UK.

“Despite improvements in patient care, three people die every day in the UK from asthma, and most therapies target symptoms rather than curing the condition.

“Many people with asthma are highly sensitive to airborne allergens such as cat dander or house dust mite — in fact many studies have shown that up to 40 per cent of children with asthma are allergic to cat allergens.

“A better understanding of how the interaction between allergens and the immune system leads to allergy is vital if we are to develop more effective and efficient treatments for this debilitating condition.”

Dr. Elaine Vickers, Research Relations Manager at Asthma UK, says: “We are delighted to see the rapid progress that Dr. Ghaem-Maghami and his colleagues are making in such a complex area of research.

“This is a great example of where Asthma UK’s research funding is leading to a better understanding of asthma which could ultimately benefit thousands of people with both asthma and allergies.”

Allergy is a disorder caused by the body’s immune system reacting to usually harmless substances found in the environment, known as allergens. Believing itself under attack, the immune system produces a molecule called IgE, which eventually leads to release of further chemicals (including histamine) by certain immune cells which together cause an inflammatory response and the classic symptoms of allergy —

itchy eyes, sneezing, runny nose and wheezing.

The Nottingham work, recently published in the *Journal of Biological Chemistry*, has focused on the role of the mannose receptor (MR), a receptor found on the surface of dendritic cells. These cells are among the first cells in the immune system that come into contact with allergens.

The team recently found that the MR binds to a wide range of allergens and plays an important role in the allergic response to house dust mite allergens. In their latest study they looked at the contribution of MR to allergy caused by a major cat allergen called Fel d 1.

They were able to prove that MR is needed for the body to recognise Fel d 1 as a potential foreign invader and for the production of IgE against Fel d 1. The discovery shows that MR plays a pivotal role not only in recognising allergens but also in provoking the body's allergic response to them.

Provided by University of Nottingham