

New molecule discovered in fight against allergy

February 15 2012

Scientists at The University of Nottingham have discovered a new molecule that could offer the hope of new treatments for people allergic to the house dust mite.

The team of immunologists led by Dr Amir Ghaem-Maghami and Professor Farouk Shakib in the University's School of Molecular Medical Sciences have identified the molecule DC-SIGN which appears to play a role in damping down the body's allergic response to the [house dust](#) mite .

The molecule can be found on the surface of the [immune cells](#) which play a key role in the recognition of a major allergen from house dust mites called Der p 1, a leading cause of asthma in northern Europe. The recognition of the allergen by the immune system is thought to lead to on-going sensitisation and the development of [allergic symptoms](#).

The discovery furthers our understanding of how the body's immune system identifies and reacts to [allergens](#), which could ultimately pave the way for developing new therapies or treatments for preventing allergies.

It's especially good news for the millions of people with asthma whose condition is worsened by their allergy to house dust mite and other environmental allergens. House dust mite droppings contain a whole raft of allergens that trigger a reaction when they become airborne and are inhaled.

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, mortality and morbidity of [allergic asthma](#) has remained high, and most therapies target symptoms rather than curing the condition.

"Many people with asthma are highly sensitive to airborne allergens such as those from house dust mite — in fact, many studies have shown that up to 80 per cent of people with asthma are allergic to house dust mite.

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

Allergy is a disorder caused by the body's immune system reacting to harmless substances found in the environment, known as allergens. Believing itself under attack, the immune system produces an antibody called IgE, which eventually leads to the 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, published this week in the *Journal of Biological Chemistry*, has focused on the role of DC-SIGN, a receptor found on the surface of antigen presenting cells. These cells are among the first cells in the [immune system](#) that come into contact with allergens.

The team found that DC-SIGN binds to major allergen from house dust mite (Der p 1) and dogs (Can f 1) and seems to play a regulatory role in the [allergic response](#) to house [dust mite](#) allergens. The binding of allergen to DC-SIGN on antigen presenting cells seems to promote a mechanism that could dampen harmful immune responses to allergens.

This is opposite to the role of another allergen reception — the mannose receptor — that has previously been identified by the Nottingham group.

The discovery shows that DC-SIGN could potentially play a beneficial role in regulating immune responses to environmental allergens.

More information: The scientific paper, Retagging Identifies Dendritic Cell-specific Intercellular Adhesion Molecule-3 (ICAM3)-grabbing Non-integrin (DC-SIGN) Protein as a Novel Receptor for a Major Allergen from House Dust Mite, is published in *The Journal of Biological Chemistry* on Friday February 17.

[www.jbc.org/content/early/2011 ... 312520.full.pdf+html](http://www.jbc.org/content/early/2011/.../312520.full.pdf+html)

Provided by University of Nottingham

Citation: New molecule discovered in fight against allergy (2012, February 15) retrieved 13 March 2024 from <https://phys.org/news/2012-02-molecule-allergy.html>

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