

## Gene linked with childhood asthma is identified, giving hope for new therapies

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A gene that is strongly associated with a risk of developing childhood onset asthma is identified in new research published online today in *Nature*.

In a genetic study of more than 2,000 children, scientists established that genetic markers on chromosome 17 had a striking effect on the risk of asthma in children. They also found that these markers altered the levels of a new gene called ORMDL3, which was at a higher level in the blood cells of children with asthma than in those without.

The results of the study suggest that the disease-associated version of the gene increases the risk of having asthma by 60-70%.

The combinations of genetic and environmental factors which cause asthma have been poorly understood. The new findings, by researchers from Imperial College London and colleagues from the UK, France, Germany, the USA and Austria, increase scientists' understanding of the causes of childhood asthma. The scientists hope their research will eventually enable new therapies to be developed.

Dr Miriam Moffatt, one of the first authors of the study who is from Imperial College's National Heart and Lung Institute, said: "This is a large study involving scientists and doctors from many countries, and we are confident that we have discovered something new and exciting about childhood asthma. These novel findings do not explain completely how asthma is caused, but they do provide a further part of the gene-

environment jigsaw that makes up the disease. We and our colleagues are currently preparing even bigger studies to find other genes of smaller effect, and to relate these to environmental factors that protect against asthma. Our eventual aim is to be able to prevent the disease in susceptible individuals."

Professor William Cookson, also from Imperial College's National Heart and Lung Institute and who co-ordinated the study, added: "Our results have found the strongest genetic effect on asthma so far discovered. We do not yet know how ORMDL3 affects asthma susceptibility. Similar genes are found in primitive organisms such as yeast, so we suspect that ORMDL3 may be a component of quite ancient immune mechanisms. It does not seem to be part of the allergic process. As its expression is increased in asthmatics, it may be possible to develop therapies against it, but this will take some time. "

Asthma is the most common chronic disease of childhood, and affects one child in seven in the UK. Its prevalence differs widely from country to country, even within Europe. The researchers carefully structured their investigation to ensure cases of childhood asthma were matched to children without disease from the same geographical areas.

The scientists reached their conclusions after comparing the genetic makeup of 994 patients with childhood onset asthma and 1,243 non-asthmatics. They looked at mutations in the building blocks, called nucleotides, which make up DNA.

There are mutations in around one in every 600 nucleotides and the scientists examined over 317,000 of these mutations to find those specific to childhood asthma. The mutations are known as single-nucleotide polymorphisms. The researchers also looked at how genes were being expressed within human blood cells. Using these two different types of analysis enabled the researchers to identify ORMDL3

as a significant risk factor for childhood asthma.

The researchers confirmed their findings by analysing the genetic makeup of over 2,000 children from Germany, and over 3,000 UK subjects born in 1958 and followed for the presence of disease until the present day.

Source: Imperial College London

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