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RESEARCH NEWS

Genetics affect lung disease and smoking behaviour, study finds

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Researchers from the United Kingdom have identified genetic differences that affect the likelihood of whether a person will smoke and the predisposition of heavy smokers and non-smokers to poor lung health.

A study by the UK Biobank Lung Exome Variant Evaluation (UK BiLEVE) team analysed genetic data from UK Biobank (ukbiobank.ac.uk), which recruited 500 000 volunteers aged 40-69 from 2006 to 2010 across the UK for long term follow-up of their health, including collection of blood samples for genetic testing.

The findings were presented at the European Respiratory Society meeting in Amsterdam and published in the *Lancet Respiratory Medicine*.[1]

The researchers selected a subset of 50 000 participants on the basis of their forced expiratory volume in one second (FEV_1) and whether or not they were heavy smokers or had never smoked. They then compared these factors with 28 million genetic variants in each participant, giving rise to the analysis of "an astronomical number" of genetic variants, commentators wrote.[2]

The team found parts of the human genome never before associated with a person's lung health, as well as five sections of DNA shown to relate to being a heavy smoker. They showed that smoking and genetic effects generally act separately and that people with and without asthma shared genetic causes of airflow obstruction.

The discoveries help to explain why some people can have relatively good lung health despite smoking and why some develop lung conditions, such as chronic obstructive pulmonary disease, even if they have never smoked. They may also help to explain why some people become heavy smokers and find it difficult to quit.

One of the lead researchers, Ian Hall, of the University of Nottingham, said, "The drugs we use to prevent or treat diseases target the proteins in our bodies, and our genes influence the production of proteins. Understanding how the genes are involved in disease, or in addiction to tobacco, can help us design and develop better and more targeted treatments that are likely to be more effective and have fewer side effects.

"UK Biobank was a bold vision when it was set up, and this study shows just how much can be achieved by using the resource. We hope to get much further detail when genetics information on all UK Biobank participants becomes available next year."

1 Wain LV, Shrine N, Miller S, et al. Novel insights into the genetics of smoking behaviour, lung function and chronic obstructive pulmonary disease in UK Biobank. *Lancet Respir Med* 2015; published online 28 Sep, http://dx.doi.org/10.1016/S2213-2600(15)00283-0.

2 Brusselle GG, Bracke KR. Elucidating COPD pathogenesis by large scale genetic analyses. *Lancet Respir Med* 2015; published online 28 Sep, http://dx.doi.org/10.1016/S2213-2600(15)00360-4.

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