

First UK Biobank genetic study reveals new links between lung disease and smoking behavior

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Credit: Vera Kratochvil/public domain

Smokers who survive their habit into old age may hold the key to better lung health for all, according to a Medical Research Council-funded (MRC) study involving researchers at The University of Nottingham and the University of Leicester.

Using genetic data from participants in the UK Biobank, the research team has identified genetic differences which affect the likelihood of whether or not a person will smoke, and the predisposition of both heavy smokers and non-smokers to suffer from poor lung health.

The new discoveries may one day help scientists develop better treatments for diseases such as chronic [obstructive pulmonary disease](#) (COPD), a life-threatening condition which affects almost one million people in the UK. The findings could also help improve interventions aimed at helping smokers to give up.

The findings are presented today (Monday) at this year's European Respiratory Society (ERS) meeting in Amsterdam and are published in the *Lancet Respiratory Medicine*.

The lead researchers, Professor Ian Hall at The University of Nottingham, and Professor Martin Tobin from the University of Leicester, studied the lung health of approximately 500,000 UK Biobank participants.

A subset of 50,000 of these participants were selected based on their lung health and whether or not they were heavy smokers or had never smoked. The researchers then compared these factors with 28 million genetic variants in each participant, making this study one of the most detailed of its kind. The team were able to find parts of the human genome never before associated with a person's lung health, as well as five sections of DNA shown for the first time to relate to being a heavy smoker.

The discoveries help to explain why some people can have relatively good lung health, despite smoking, and why some can suffer from lung conditions even if they have never smoked before. Knowing why they are more likely to develop [lung disease](#) or to become [heavy smokers](#) is

important for developing treatments for these diseases and for helping smokers to quit.

Professor Ian Hall 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."

Professor Martin Tobin said: "Smoking is the biggest lifestyle risk factor for COPD. Many, but not all, smokers develop the disease. Genetics play a big part, as they do in smoking behaviour. Our research helps to tell us why, paving the way for improved prevention and treatment. Stopping smoking is the best way to prevent smoking-related diseases such as COPD, cancers and heart disease."

The scientists hope to expand the study to look at the genetics of all 500,000 participants when the data become available in 2016.

Dr David Crosby, who leads on experimental medicine at the MRC, said: "UK Biobank was set up by the MRC and other funders for just this type of important research. Thanks to the 500,000 people who have volunteered to make this resource the biggest in Europe, researchers will have access to a huge amount of information about the part that environment and genetics play in disease. The genetics work done by this group will be incorporated into UK Biobank for other researchers working in different areas to use in their own studies, bringing closer the promise of new treatments and drugs for a whole range of diseases and conditions."

More information: Novel insights into the genetics of smoking behaviour, lung function and chronic obstructive pulmonary disease in UK Biobank by Louise V Wain et al is published in the Lancet Respiratory Medicine.

People who smoke can receive support to quit smoking and "Stoptober" is a great way to quit: stoptober.smokefree.nhs.uk/

Provided by University of Nottingham

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