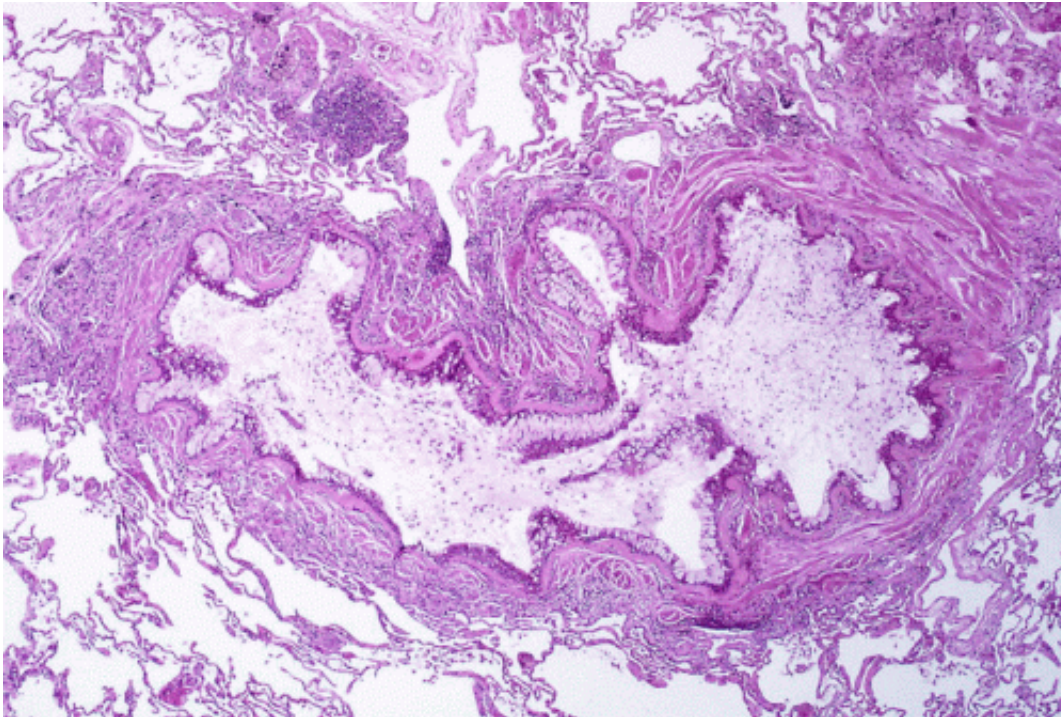


# Study reveals new way lungs respond in asthma attacks

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Obstruction of the lumen of a bronchiole by mucoid exudate, goblet cell metaplasia, and epithelial basement membrane thickening in a person with asthma. Credit: Yale Rosen/Wikipedia/CC BY-SA 2.0

Scientists have discovered a new way in which the lungs operate during asthma that could lead to new treatments for the disease.

In a study published today in the *Proceedings of the National Academy of*

*Sciences*, the researchers at the Leicester Respiratory Biomedical Research Unit at the University of Leicester and the Medical Research Council (MRC) Toxicology Unit have identified a new biochemical process that controls how air enters and leaves the lungs during normal lung function and during [asthma](#).

The scientists - funded by the Medical Research Council (MRC) and working in collaboration with the National Heart and Lung Institute at Imperial College London - used state-of-the-art methods to dissect the biochemical pathways involved in the contraction of the airway muscle.

By disrupting these [biochemical pathways](#) in a mouse model of asthma the scientists discovered that they could prevent airway narrowing and maintain normal lung function.

Lab experiments on mice, such as this, allow us to establish causal effects in this species, but it is too early to say whether these results apply to people.

Co-lead author of the study Professor Andrew Tobin from the MRC Toxicology Unit which is located at the University of Leicester, said: "This is a real breakthrough in our understanding of how the lung works in both normal conditions and during [disease](#). The fundamental biochemical process that we have discovered will ultimately allow us to better design ways to develop new treatments for those suffering from asthma and chronic obstructive pulmonary disease (COPD)."

The lung is made up of tiny tubes called airways that allow air in and out of the lung. Each airway is surrounded by muscles that control the diameter of the airway.

In asthma and other airway diseases such as COPD the airway muscle contracts causing the airways to become narrow and restricting the flow

of air in and out of the [lung](#).

5.4 million people in the UK suffer with asthma, with the disease affecting one in every 11 people and one in five households.

The World Health Organisation estimates show that 235 million people worldwide currently suffer from asthma with over 80% of asthma deaths occurring in low and lower-middle income countries. The disease is predicted to increase worldwide over the next 10 years.

Dr Yassine Amrani, co-lead author from the University of Leicester's Department of Infection, Immunity and Inflammation, added: "We have taken a major step forward in our understanding of how airways of patients with asthma tend to narrow excessively, a feature often encountered during severe forms of the disease. By uncovering factors responsible for this exaggerated bronchospasm, this breakthrough will lay the essential foundations on which to build new strategies to combat [airway](#) diseases such as asthma."

**More information:** Mapping physiological G protein-coupled receptor signaling pathways reveals a role for receptor phosphorylation in airway contraction, *Proceedings of the National Academy of Sciences*, [www.pnas.org/cgi/doi/10.1073/pnas.1521706113](http://www.pnas.org/cgi/doi/10.1073/pnas.1521706113)

Provided by University of Leicester

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