

Allergic asthma: Researchers identify a key molecule

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It is still not fully clear as to why so many people today suffer from allergic asthma. Researchers from the UFZ and the University of Leipzig have now been successful in discovering a molecule that plays a significant role in the development of allergic asthma. Credit: Alexander Raths, fotolia

Allergies are becoming more commonplace, particularly in industrialised

coun-tries. In addition to hay fever, allergic asthma is currently considered to be one of the most widespread allergies. UFZ researchers and their colleagues from the University of Leipzig have recently been successful in finding a protein that plays a critical role in the development of allergic airway inflammation. The discovery could pave the way for new therapies, as it also influences the pro-gression of the allergy.

Worldwide, there are more than 300 million [asthma patients](#). In Germany alone, 10 - 15 percent of children suffer from [allergic asthma](#) that is often impaired by environ-mental pollutants. With the medications available today, symptoms can be effectively relieved, but without tackling the root cause. The precise reasons as to why certain people suffer from allergic asthma are still not fully clear. Tobias Polte and his team from the Department of Environmental Immunology at the Helmholtz Centre for Environmental Research (UFZ) collaborated with Jan Simon and his colleagues from the Clinic for Dermatology, Venereology and Allergology at the University of Leipzig and have recently been successful in discovering a molecule that plays a significant role in the development of allergic airway inflammation – as demonstrated in their recent publication in *Nature Communications*.

The protein syndecan-4 is found in the cell membrane of antigen presenting cells (APCs). These are immune cells that detect exogenous substances (antigens). They internalize them and migrate to the nearest lymph node, where they present them to other [immune cells](#), namely T-cells. In this way they initiate an [immune reaction](#) that leads to sensitization to a particular antigen, like for example to a pollen allergen. It is upon renewed contact with this pollen allergen that the typical symptoms of allergic asthma arise. "In our study we were able to demonstrate that syndecan-4 plays a critical role in APC migration", says Polte. "When syndecan-4 is lacking, the APCs cannot find their way to the T-cells and consequently cannot activate them. As a result, the

immune reaction cannot take place and the sensitization to a particular antigen ceases."

Through investigations at the University of Leipzig, the researchers were also able to show that syndecan-4 in the APCs also plays a central role in the inflammatory process of allergic asthma: the allergic asthma symptoms of mice improved when they were given antibodies against syndecan-4. "In principle, syndecan-4 would be a good starting point for new therapies", says Polte. "Since it exhibits various other functions in cell metabolism, potential side effects are still difficult to assess." To relieve the symptoms of patients with allergic asthma, the treatment of allergic [airway inflammation](#) with glucocorticoids and the use of a bronchodilator asthma spray will continue to be paramount in the near future. "There will only be an effective therapy that gets to the root cause when we have fully understood the relationships behind the development of allergic asthma", says Polte. "Nevertheless, in our study we were able to discover an important component with syndecan-4 that should help us on the road to identifying new therapies."

More information: Tobias Polte et al. "Critical role for syndecan-4 in dendritic cell migration during development of allergic airway inflammation," *Nature Communications* (2015). [DOI: 10.1038/ncomms8554](#)

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