

The role of B cells in the enhancement of pollen allergy

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Scientists at Helmholtz Zentrum München and TU München discovered a new mechanism how non-allergenic pollen mediators can enhance allergic reactions. Especially the so-called B cells play a critical role in this process. The results were recently published in the journal *Allergy* and might lead to new approaches for therapies.

The team of Prof. Carsten Schmidt-Weber and Prof. Jan Gutermuth of the Center of Allergy & Environment (ZAUM) at Helmholtz Zentrum München and TU München investigated the influence of [pollen](#) extract of common ragweed, also known as *Ambrosia artemisiifolia*, on B cells. These cells can produce immunoglobulin E (IgE), the key trigger and an important diagnostic marker of [allergic reactions](#). "We were able to show that pollen extract enhances the secretion of [allergy](#) driving IgE antibodies in vitro and in vivo," explains Dr. Sebastian Öder who is leading author of the study together with Dr. Francesca Alessandrini. "Moreover, our colleagues at the Swiss Institute of Allergy and Asthma Research (SIAF) confirmed this effect also for human B cells."

By excluding various substances, the scientists tested which components exactly caused the reaction. Therefore, B cells were either exposed to the main *Ambrosia* allergen Amb a 1, the pollen associated substance PPE1 or the total extract and a protein/allergen free fraction of the extract, respectively. "Interestingly, all substances increased the respective immune reaction of the B cells, except Amb a1," Öder says. Therefore, the authors conclude that the enhanced secretion of IgE is independent of the main allergen Amb a 1, but is rather induced by small compounds

like PPE1.

Mechanism not only relevant for Ambrosia

"Until now it was assumed that the allergy promoting effect of non-allergenic plant compounds was mainly mediated by dendritic [cells](#). The new mechanism that we found therefore allows a different view on this issue and furthermore offers new starting points for the development of therapies against allergic diseases", says Schmidt-Weber, director of ZAUM.

To test the relevance of their results, the Helmholtz researchers also investigated the effect of other pollen extracts like from birch, pine and timothy grass. They showed that the effect plays a role not only for Ambrosia, but is also relevant for trees and grasses. "In the future we are planning to investigate the effect of climatic changes on the B cell mediated allergenicity of pollen, since climatic changes may impact the composition of pollen," comments Prof. Claudia Traidl-Hoffmann. She is director of the Christine Kühne – Center for Allergy Research and Education (CK-CARE), which provided considerable financial support for the study.

More information: "Pollen derived non-allergenic substances enhance Th2-induced IgE production in B-cells." *Allergy*, [DOI: 10.1111/all.12707](#)

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