

Nasal biomarkers predict severity of pollen-specific allergy symptoms

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For people with allergies, contact with pollen leads to symptoms such as

sneezing, rhinitis and watery eyes. This may sound trivial, but is in fact a complex correlation of physiological processes. As these have not yet been fully understood, we do not know exactly yet how allergies develop and how the symptoms are triggered.

Symptoms can be predicted in advance

A research group led by the Institute of Environmental Medicine at Helmholtz Zentrum München and Technical University of Munich (Research Association UNIKA-T), examined patients with pollen-induced [allergic rhinitis](#) and people without [allergy](#) over a period of one year. In addition to a digital [symptom](#) diary kept daily by the study participants, the researchers took samples of blood and nasal secretion. They then compared the immune variables (cytokines, chemokines and pollen-specific immunoglobulins) in these samples during and after the pollen season. As a result, they identified the endogenous messenger substances IL-8 and IL-33 as well as the antibodies sIgG4 and sIgE as biomarkers (= measurable characteristics with relevance for biological processes). These biomarkers show a significant correlation with pollen-specific nasal symptoms (proven by Spearman's rank correlation coefficient). The researchers were now able to predict the severity of the symptoms even before the start of the pollen season based on the expression rate of these biomarkers in people with and without allergy, independent of their individual genetic disposition.

Multiple applications for biomarkers

Mehmet Gökkaya, researcher at UNIKA-T and first author of the study: "The identification of biomarkers helps us in three ways. Firstly, by predicting the severity of nasal symptoms we can better identify the patients who benefit the most from therapeutic treatment. Secondly, biomarkers can help us understand the processes at work during the

development of allergies in non-allergic patients and so help us to be ultimately able to prevent them. And thirdly, biomarkers can be used to identify the physiological processes that originally cause these symptoms. Possibly this could be a new starting point for the development of novel therapeutics."

More information: Mehmet Gökkaya et al, Defining biomarkers to predict symptoms in subjects with and without allergy under natural pollen exposure, *Journal of Allergy and Clinical Immunology* (2020).
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