

New insights on allergies may improve diagnosis and treatment

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Results from a study led by investigators at Massachusetts General Hospital may help to improve the diagnosis and treatment of allergies, pointing to a potential marker of these conditions and a new therapeutic strategy. The research is published in *Nature*.

Nearly one third of the world's population suffers from allergies. These conditions are caused by certain antibodies—called IgE antibodies—that bind to allergens such as peanuts and trigger a reaction that releases an array of molecules that cause [allergic symptoms](#), and in extreme cases, potentially life-threatening anaphylaxis.

Scientists have been perplexed by the fact that many individuals have circulating allergen-specific IgE antibodies without ever developing allergy symptoms. For example, about half of the people who have peanut-specific IgE antibodies (or test positive to a peanut skin prick test) do not have peanut allergies. In addition, some allergic individuals outgrow their symptoms yet still retain detectable levels of circulating allergen-specific IgE.

To look into these mysteries, Robert Anthony, Ph.D., of the Center for Immunology and Inflammatory Diseases, and his colleagues compared IgE from individuals with peanut allergies with IgE from individuals without any allergies. The analyses revealed an increase in a particular sugar residue called sialic acid on IgE from peanut allergic individuals.

The researchers also found that adding sialic acid to IgE enhanced [allergic reactions](#) triggered by IgE in animal models, while removing sialic acid from IgE dampened these reactions and reduced anaphylaxis.

"Our results indicate that quantifying sialic acid on IgE may serve as a marker for more accurate diagnoses of allergic disease, and that removal of sialic acid from IgE is a novel strategy for treating affected patients," said Dr. Anthony.

Additional research on the mechanisms behind sialic acid's effects on IgE activity could provide additional insights into allergies and their causes. The team is currently planning studies to determine how removing sialic acid from IgE attenuates [allergy](#), and develop strategies to exploit this therapeutically.

More information: Kai-Ting C. Shade et al, Sialylation of immunoglobulin E is a determinant of allergic pathogenicity, *Nature* (2020). [DOI: 10.1038/s41586-020-2311-z](https://doi.org/10.1038/s41586-020-2311-z)

Provided by Massachusetts General Hospital

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