

Researchers successfully prevent peanut allergic reactions in mice, blocking onset in its tracks

February 8 2023, by Karla Cruise



Credit: Matt Cashore/University of Notre Dame

An allergen-specific inhibitor devised by researchers at the University of Notre Dame and the Indiana University School of Medicine has successfully prevented potentially life-threatening allergic responses to peanuts.

The results of the new study were just published in *Science Translational Medicine*.

Peanuts cause severe, sometimes fatal, reactions in an estimated 1.1 percent of the global population. Strict dietary avoidance is the most common therapy for [peanut allergies](#), but the risk of accidental exposure is high. There currently are no therapies to prevent allergic events from happening in the first place.

"Our approach is unique because our inhibitor starts working before the allergen has a chance to trigger an allergic reaction," said Başar Bilgiçer, professor of chemical and biomolecular engineering at the University of Notre Dame. "Our collaboration with Dr. Mark Kaplan at Indiana University School of Medicine and Dr. Scott Smith at Vanderbilt University Medical Center made the development of these inhibitors possible. With their help, we were able to demonstrate the potency of our approach in animal studies."

Using a cHBI inhibitor [that they designed in their previous work](#), the researchers prevented [allergic reactions](#) in mice with human immune cells. A single administration provided protection against peanut allergic reaction for over two weeks. Moreover, when given shortly after the onset of symptoms, the inhibitor stopped the progression of the allergic reaction in its tracks.

When IgE antibodies and peanut allergens interact in an allergic person's bloodstream, [inflammatory mediators](#) such as histamine are released in large quantities throughout the body.

"The release of histamines is meant to fight against invading pathogens, but, in the case of peanut [allergy](#), there is no pathogen, just peanut proteins," said Bilgiçer.

The new inhibitor effectively masks the immune system's ability to recognize the allergen, allowing it to fly under the immune system's radar without initiating a dangerous response or compromising its ability to fight real pathogens.

The researchers developed inhibitors specifically for [peanut](#) allergy because it is the most common food allergy, with high prevalence especially in children. Nevertheless, the success of cHBI in this study paves the way for the development of other allergen-specific inhibitors.

"What we've developed is a platform technology," said Bilgiçer. "The same design and engineering principles used in this paper can be applied in developing inhibitors to treat a range of other allergies such as shellfish and penicillin."

The research will now advance to preclinical trials.

More information: Nada S. Alakhras et al, Peanut allergen inhibition prevents anaphylaxis in a humanized mouse model, *Science Translational Medicine* (2023). [DOI: 10.1126/scitranslmed.add6373](https://doi.org/10.1126/scitranslmed.add6373)

Provided by University of Notre Dame

Citation: Researchers successfully prevent peanut allergic reactions in mice, blocking onset in its tracks (2023, February 8) retrieved 11 May 2024 from <https://medicalxpress.com/news/2023-02-successfully-peanut-allergic-reactions-mice.html>

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