# Research on Allergies

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Allergies are exaggerated immune responses to substances that would otherwise be seen as harmless. Allergies rank high on the list among the world's most common health conditions. They begin when an allergen, the substance responsible for the reaction, causes the production of immunoglobulin E (IgE) antibodies, which coat mast cells. On subsequent re-exposure to the allergen, IgE reacts and causes the release of histamine and other inflammatory products from mast cells. These released substances lead to several of the signs and symptoms associated with allergies.

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Patients may have experiences that range from mild and uncomfortable to severe and life-threatening. The hypersensitive reactions that occur are highly dependent on the area of the body that the allergen targets. For example, if in the eyes, then one may have red, itchy, watery and swollen eyes, while allergens that target the respiratory tract may cause difficulties breathing. Itching, swelling or cracking may occur on the skin, whereas nausea, vomiting, diarrhea and constipation are gastrointestinal symptoms.

The most common allergens are found in food ingredients as well as pollen, mold spores, dust mites, animal dander and insect venom. Diagnosis can be made with the help of medical history and skin testing. The mainstay of treatment is to avoid allergen exposure; however, if this is impossible, then

antihistamines and other anti-inflammatory drugs are used. There are several studies being conducted that are focused on understanding the immune processes behind allergies, preventing allergy induction and building up tolerance.

## Allergen-Specific Therapies

Oral immunotherapy (OIT) is an area of intensive research, with the goal of allergen-specific therapy. In OIT, patients are given small quantities of the allergen orally, and over a period of time the quantity is gradually increased. This is done until a target amount is reached daily with periodic intervals and a continual increase in the amount of food that the patients are allergic to.

The OIT studies have been able to demonstrate temporary desensitization in many patients; however, many other patients developed reactions with increasing doses of the allergen used. The permanence of OIT results has not yet been established, because these studies are still being conducted. Similar to these OIT studies, work is being done on sublingual immunotherapy, where the allergen is in a liquid formulation and briefly held under the tongue before it is swallowed. Results are promising, with fewer reactions being noted in comparison to the OIT trials, but the results are not as robust.

With the help of a patch, patients can receive epicutaneous immunotherapy (EPIT), whereby the allergen is slowly released in small quantities into the skin. Theoretically, this gradual release of allergen helps build up tolerance over time.

Other research into allergen-specific therapies is looking at the possibility of modifying allergenic proteins so that the immune system no longer develops an exaggerated immune response to them. This novel approach is being taken with the help of biotechnology.

## Allergen Non-Specific Therapies

Other allergy studies are being done from an allergen-nonspecific perspective. Examples of these include the use of probiotics and anti-IgE pharmacotherapy. These therapies are nonspecific, because they are independent of the allergen. Probiotics are believed to cause immunological changes that can treat and prevent eczema and food allergies. They are being investigated in mouse models. Studies regarding anti-IgE pharmacotherapy are limited, but the reasoning behind them are their potential ability to lower sensitivity by reducing IgE antibodies in a patient’s blood.

## Sources


- my.clevelandclinic.org/.../childrens_overview
- www.healthychildren.org/.../Allergy-Causes.aspx
- http://www.cdc.gov/nchs/data/databriefs/db121.htm
- https://kidswithfoodallergies.org/
- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4414527/


## Further Reading

- All Allergy Content
- What are Allergies?
- Different Types of Allergies
- Old Friends Hypothesis
- What is the Microbial Diversity Hypothesis?

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