What causes allergies?

KS2 KS3 Ages 7-14 ⏰ 3 min read

An allergy is an immune response to something that isn't actually harmful. Your immune system misidentifies an innocent substance — a peanut protein, a pollen grain, a cat hair — as a dangerous pathogen and mounts a full defensive response against it. The symptoms you experience (sneezing, itching, swelling, in severe cases anaphylaxis) are the immune system fighting a threat that isn't there.

How does an allergy develop?

Allergies usually develop in two stages. The first time you encounter a substance you'll become allergic to, the immune system incorrectly files it as dangerous and produces antibodies (specifically IgE antibodies) against it. No symptoms this time — the system is just preparing. The next time you encounter the same substance, those antibodies are ready. They trigger mast cells (immune cells packed with histamine) to release their contents into surrounding tissue. That release of histamine causes the inflammation, swelling, itching, and mucus production you experience as an allergic reaction.

Imagine your immune system's filing system made an error and put "pollen" in the same folder as "dangerous pathogens." Every spring, when pollen arrives, the system opens that folder, sees "DANGER," and launches a full response. The problem isn't the pollen — it's the misfiling. Antihistamines work by blocking histamine receptors, essentially turning down the alarm before it can trigger symptoms. But they don't fix the misfiling; they just muffle the alarm.

Why are allergies more common now?

Allergy rates have risen dramatically in wealthy countries over the past 50 years. The leading explanation is the **hygiene hypothesis**: modern children are exposed to far fewer microbes and parasites than previous generations, because of cleaner water, antibiotics, reduced farm animal contact, and smaller families. Without enough "practice" threats during early childhood, the immune system may become hypersensitive and start flagging harmless things as dangerous. Countries with lower hygiene standards generally have lower allergy rates.

What is anaphylaxis?

Anaphylaxis is a severe, whole-body allergic reaction that can be life-threatening. In anaphylaxis, histamine floods the system: blood pressure drops, airways swell and narrow, and the body goes into shock. Common triggers include peanuts, tree nuts, shellfish, bee stings, and certain medications. Treatment is an injection of adrenaline (epinephrine) — which is what EpiPens contain. Adrenaline rapidly reverses the blood pressure drop and airway narrowing, buying time to reach hospital.