



## May 2012 Edition

### Allergies may actually have originated to protect us against natural toxins

Allergy season came early this year. Unprecedented warmth this winter caused plants to begin blooming earlier than normal, flooding the air with pollen and triggering fits of sneezing, runny noses, itches and rashes. Scientists have struggled for decades to understand why humans suffer such nasty allergic reactions and why the incidence of allergies -- such as to peanuts -- seems to be increasing almost exponentially. There still is no good answer, but Yale researchers suggested April 25th, 2012 that allergies may be an outgrowth of the way our body protects us from noxious substances in the environment.

Humans and other mammals have two major types of immunity; intriguingly, neither birds nor reptiles share these immune defenses. Type 4 immunity involves the defense against viruses, bacteria and the like. It is an active defense in which cells from the immune system engulf and destroy the invaders. Type 1 immunity is traditionally held to be directed against larger parasites, such as helminth worms and biting spiders. It is more of a passive defense in which the body erects barriers against invasion. Conventional wisdom says that allergens share some structural similarities with these parasites that mistakenly cause the body to direct an immune defense against them.

Immunobiologist Ruslan Medzhitov of Yale University and his colleagues argue in the current issue of Nature, however, that there are several problems with this view. First and foremost, most allergens do not actually have any obvious relationship

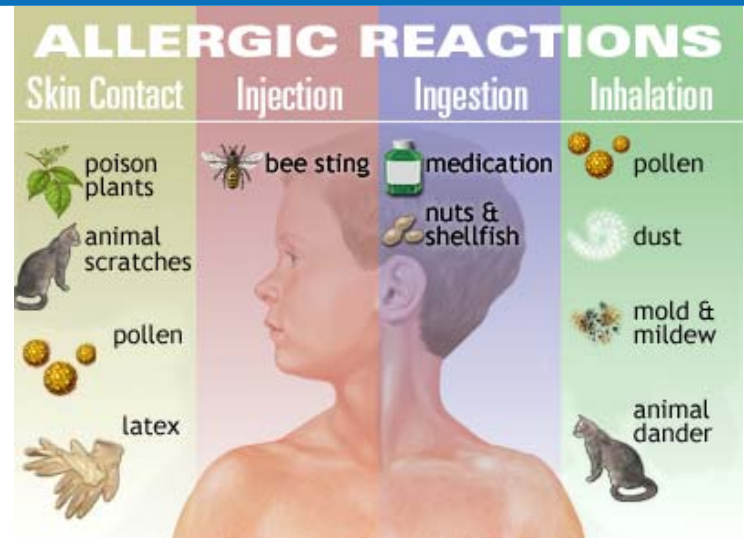
with parasitic worms. Second, the Type 1 immunity, manifested as anaphylaxis, occurs extremely rapidly, even though there is no need for such a speedy response to the slowly multiplying parasites; even the type 4 response to rapidly replicating viruses and bacteria requires hours to days. And finally, allergic hypersensitivity can develop against a wide variety of allergens that have little in common in terms of their structure or origin: pollen, shellfish, peanuts, bee venom, latex, penicillin and nickel.

Medzhitov argues that Type 1 immunity actually evolved against a broader variety of stimuli, including venoms, natural toxins and irritants. Most of the allergic reactions can then be viewed as efforts to rid the body of such substances. A runny nose and sneezing help flush such irritants out of the nose and lungs. Scratching promotes removal of toxins from the skin. Such reactions also serve as a signal to avoid places where stinging insects or environmental toxins are common.

But this system can go awry also. "We believe that allergic hypersensitivity evolved to survey the environment for the presence of noxious substances," Medzhitov said. "After the first exposure, the immune system gains a memory, and subsequent exposure to even minute amounts will induce an anticipatory response that helps minimize potentially harmful effects.... According to this view, hypersensitivity to allergens triggers avoidance of a sub-optimal environment."

### This Spring's allergies affect blood donations

The Red Cross sees a dip in blood donations during the typical spring allergy months. According to the Red Cross, potential donors cited cold-like symptoms for their reason for feeling ill and not up to donating blood. Some donors also told the Red Cross they weren't sure if they were suffering from allergies or from a cold. The Red Cross said it's OK for people to donate blood if they have allergies, but a cold, sinus or respiratory infection could impact someone's ability to give blood. The Red Cross said if a person is on allergy medication and is question whether they can donate blood on the medication they should ask a Red Cross professional before donating.



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