

Peanut-Allergic Individuals Unlikely to React to Soy

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Cross-reactivity in allergic reactions occurs when the proteins in one substance are similar to the proteins found in another. Because peanuts and soy are both legumes, there is concern that peanut-sensitive individuals will also react to soy. However, clinical studies indicate that cross-reactivity between peanut and soy is a relatively infrequent occurrence. According to the University of [Manchester](#), “Most soy allergic individuals are tolerant of peanut ... This does not mean that absolutely no patients exist that demonstrate cross-reactive allergy to multiple legumes, but it is rare.”

Allergen cross-reactivities occur when IgE antibodies, originally raised against a specific allergen, bind to identical or highly similar surface areas of another related allergen. These cross-reactivities are largely determined by secondary and tertiary structural similarities between allergens. The general thinking is that cross-reactivity requires more than 70% sequence identity, while proteins that share less than 50% sequence identity are rarely cross-reactive. This also implies that cross-reactive proteins have a similar three-dimensional fold and belong to the same protein family.¹ As somewhat of a side note, there is also evidence indicating that IgE cross-reactivity exists between unrelated allergens, although that type of cross-reactivity is less common.²

Research into the cross-reactivity between peanuts and soy has been underway for many decades. For example, in 1985, Sampson and McCaskill³ found that among 113 children with atopic dermatitis evaluated with double-blind, placebo-controlled, oral food challenges (DBPCFCs), only 1 (0.8%) had clinical allergy to both peanuts and soy, despite 19% reacting to peanut and 5% to soy. In 1989, Bock and Atkins⁴ studied 32 children with peanut allergy confirmed by DBPCFCs and found that 10 (31%) had a positive skin prick test (SPT) to soy, but only 1 (3%) of those with peanut allergy had a clinical reaction to soy. This study illustrates two important points. One, clinical reaction to soy in peanut-sensitive individuals is relatively uncommon and two, the rate of positive SPTs to soy is much greater than rate of clinical reaction. This is true in peanut-sensitive individuals as well as non-peanut-sensitive individuals.^{5,6}

Several other studies in addition to the ones by Sampson and McCaskill³ and Bock and Atkins⁴ have found that clinical reaction to soy in peanut-sensitive individuals is relatively rare and that positive SPTs to soy are much more common than clinical reactions.^{7,8} Also, although all four of the studies cited above were conducted in the U.S., the results of European studies are similar. For example, in France, Moneret-Vautrin et al.⁹ found that of 142 (50 diagnosed by DBPCFC) peanut-sensitive individuals, most of whom were below 15 years of age, 14 had a positive SPT to soy whereas only 2 (1.4%) responded clinically.

Finally, and most recently, in the United Kingdom, Patel et al.¹⁰ examined the cross-reactivity between peanut and soy in 64 individuals aged 8-16 years, all of whom reacted to peanut in response to a DBPCFC, 15 (22%) of which with anaphylaxis. Of the 64 patients, 2 (~3%) experienced objective symptoms to roasted soy (experiencing mild objective symptoms at cumulative 1 g soy protein).

In conclusion, among the eight major allergenic foods (milk, eggs, fish, crustacean shellfish, tree nuts, peanuts, wheat and soybean) in the U.S., the prevalence of soy among adults¹¹ and children^{12,13} is the lowest. As reviewed, research published over the past 3 decades shows that among individuals allergic to peanuts, relatively few-- certainly less than 5%-- will also be allergic to soy.

References

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