



Cambridge
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Cross Reactions

Occasionally IgG reactions with foods occur, although a person is convinced that they have never eaten them. Once the diet has been checked and no 'hidden' sources of the food can be found, one of the possible reasons for this anomaly can be explained by the presence of what is known as a cross reaction.

Cross reactions occur as the antibody recognises not only the antigen for which it was originally formed, but also other antigens which are very similar. This occurs because some foods and pollen, although they are not directly related to each other have identical molecules or identical parts of molecules. These regions are called epitopes and can be recognised by an antibody. This phenomenon has been observed for a long time, and common epitopes are identified more and more by means of modern molecular diagnostics.

If there is a homology of over 70% i.e. congruence between various allergens of over 70%, cross reactions can occur. A clinically relevant cross reaction is possible between 40% and 70%. A cross reaction therefore only occurs if a person is sensitised to a molecule which is also found in something else they are exposed to. As already mentioned, this could include food and pollen, but also latex and insects. Other factors which contribute to whether a cross reaction becomes clinically manifest include:

- The concentration of the allergen
- The expression of the allergen depending on status of maturity
- Temperature instability of the allergen, such as destruction through heating
- Geographic factors, biodiversity
- Cofactors such as physical exertion, taking of medication

The information in this factsheet is to draw your attention to the existence of cross reactions and the fact that they can be the reason for what may initially appear as contradictory results.



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Example:

Many people have a type I allergy to tropomyosin, the main allergen found in the dust mite. To help them overcome their allergy many will be desensitised by allergologists and some will also manage to overcome it without medication.

It is common to both patient groups that they form IgG antibodies - namely IgG4 – against the dust mites. This IgG4 class antibody is produced in very high concentrations and can be detected in the FoodPrint Test.

Tropomyosin is, however, is not only found in dust mites, but also in all invertebrates albeit in different concentrations. Commonly eaten invertebrates include mussels, oysters, scampi, squid, shrimps as well as lobsters. Therefore, if someone is sensitive to dust mites they can also react to oysters. This could then be picked up in their FoodPrint results showing a positive reading for oyster even though they may never have eaten it.

Some of the most known cross reactions include:

Mugwort (*Artemisia Vulgaris*):

Aniseed, apple, artichoke, camomile, cardamom, carrots, celeriac, cinnamon, coriander, cucumber, cumin, fennel, garlic, ginger, grape, kiwi, lychee, mango, melon, nutmeg, oregano, paprika (spice), parsley, pepper (white & black), potato, sunflower seed and tomato.

Birch Tree (*Betula spp.*):

Almond, apple, apricot, carrots, cherry, fig, hazelnut, kiwi, lychee, nectarine, pear and plum.

House Dust Mite/Cockroaches/Insects:

Crab, crayfish, lobster, mussels (blue), octopus, oysters, scallop, shrimp/prawn, snails, squid and cuttlefish

Latex:

Avocado, banana, cassava, fig, kiwi, mango, melon, papaya, peach, potato, spinach, sweet chestnut and tomato

Pollens:

Pineapple, melon, watermelon, tomato, banana, orange, pea and tree nuts.