



Modern allergy diagnostics

DPA-Dx Peanut

Better safe than sorry with peanut allergy

Peanut allergy

- ... is increasing dramatically worldwide.
- ... is the most common allergy in childhood – often persisting life-long.
- ... is particularly problematic since peanuts are an inapparent component of many everyday products (foods, cosmetics).
- ... causes mostly severe, systemic reactions (anaphylaxis).
- ... varies considerably in its clinical picture, depending on which peanut proteins the patient is sensitised to. Different components have particular characteristics which are associated with varying symptom constellations.

Storage proteins:

Ara h 1 Ara h 2 Ara h 3 Ara h 6 Ara h 7

- Heat stable and digestion resistant
- High risk of severe reactions
- Cross reactions with e.g. soybean, lentils, peas are possible

Profilin:

Ara h 5

- Heat labile
- Mild reactions most likely
- Cross reactions with e.g. latex, birch, timothy grass are possible

High risk



Low risk

Lipid transfer protein:

Ara h 9

- Heat stable
- Mild, local reactions or severe reactions are possible
- High prevalence in southern Europe
- Cross reactions with e.g. peach, hazelnut, apple are possible

PR 10 protein:

Ara h 8

(Homologue of Bet v 1 from birch pollen)

- Heat labile
- Mild reactions very likely (oral allergy syndrome, OAS)
- Cross reactions with e.g. birch, apple, hazelnut are possible



In contrast to component-based diagnostics, extract-based diagnostics (prick test or in vitro) do not differentiate between a “true”(primary) and a secondary peanut allergy. However, this differentiation is essential as it provides an important indication of the severity of symptoms.

Primary peanut allergy	Secondary peanut allergy
<ul style="list-style-type: none"> ■ Primary sensitisation to storage proteins of peanut (Ara h 1, Ara h 2, Ara h 3, Ara h 6, Ara h 7) ■ Associated with systemic reactions ■ Strict avoidance of even small amounts of peanut necessary ■ Cooking food does not affect the allergenicity ■ Manifestation already in infancy possible 	<ul style="list-style-type: none"> ■ Primary sensitisation to Bet v 1 of birch pollen (homologue of Ara h 8) or profilins (Ara h 5): pollen-associated food allergy ■ Associated with mild symptoms (OAS) ■ Strict avoidance of peanuts not absolutely necessary ■ Cooking food can reduce the allergenicity ■ Manifestation mostly from school age

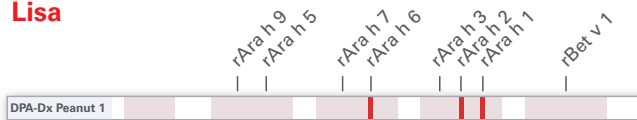
Case example

- Lisa and Tom suffer from unspecific symptoms (tingling mouth, eczema, nausea, rhinoconjunctivitis)
- Prick test with peanut extract: positive in both patients

However: Are both Lisa and Tom exposed to the same risk of severe reactions and need to carry an emergency kit?
Defined partial allergen diagnostics (DPA-Dx) provide essential information:

EUROLINE DPA-Dx Peanut 1

Lisa



Allergen	Class	0	1	2	3	4	5	6
rBet v 1	0	0	0	0	0	0	0	0
rAra h 1	5	0	1	2	3	4	5	6
rAra h 2	4	0	1	2	3	4	5	6
rAra h 3	0	0	0	0	0	0	0	0
rAra h 6	3	0	1	2	3	4	5	6
rAra h 7	0	0	0	0	0	0	0	0
rAra h 5	0	0	0	0	0	0	0	0
rAra h 9	0	0	0	0	0	0	0	0

Results Lisa:

Positive reactions to Ara h 1, Ara h 2 and Ara h 6; negative for Ara h 3, Ara h 7, Ara h 5, Ara h 9 and Bet v 1 of birch pollen.

Interpretation:

Primary sensitisation to peanut with a high risk of a severe systemic reaction, since Lisa is sensitised to several storage proteins.

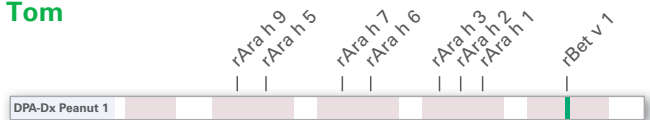
Provocation test:

Not absolutely necessary, since the clinical manifestation has already been confirmed by anamnesis and prick test, and fresh contact with peanut could trigger reactions of greater severity.

Therapy recommendation:

Strict avoidance of the allergen source is essential. Lisa should always carry an emergency set.

Tom



Allergen	Class	0	1	2	3	4	5	6
rBet v 1	4	0	1	2	3	4	5	6
rAra h 1	0	0	0	0	0	0	0	0
rAra h 2	0	0	0	0	0	0	0	0
rAra h 3	0	0	0	0	0	0	0	0
rAra h 6	0	0	0	0	0	0	0	0
rAra h 7	0	0	0	0	0	0	0	0
rAra h 5	0	0	0	0	0	0	0	0
rAra h 9	0	0	0	0	0	0	0	0

Results Tom:

No reactions to Ara h 1, Ara h 2, Ara h 3, Ara h 5, Ara h 6, Ara h 7, Ara h 9; positive for Bet v 1 of birch pollen.

Interpretation:

Primary sensitisation to Bet v 1 from birch, the Ara h 8 homologue, and therefore birch pollen-associated food allergy due to a cross reaction; mild symptoms very likely.

Provocation test:

Recommended in order to exclude a sensitisation to high-risk components not included in the test.

Therapy recommendation*:

Specific immunotherapy (SIT) against birch pollen*. Since Tom has an assumed cross reaction with Ara h 8 (peanut), it is likely that the pollen-associated food allergy will also be alleviated by the SIT.

*If the birch pollen allergy is a severe burden for the patient (Worm M et al., Allergo J Int 2014, 23: 1)

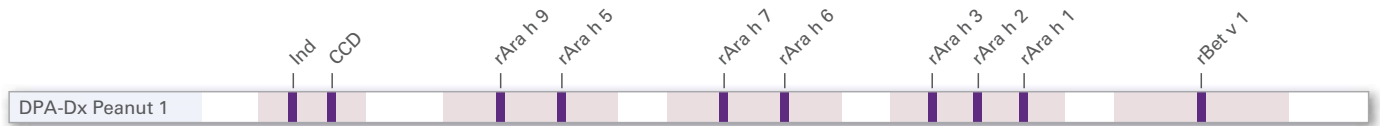
Better safe than sorry:

Multiplex tests for precise and comprehensive diagnostics of peanut sensitisation

In suspected cases of peanut allergy, the simultaneous analysis of all available components is recommended. If only individual high-risk components are tested, the result may be negative in some circumstances. This could lead to false conclusions, since a sensitisation to other high-risk components may be overlooked. A comprehensive sensitisation profile is therefore essential and can be established by a multiplex test using very small amounts of serum (100µl/8 allergen components). In contrast, three to four times as much serum (320–400µl/8 allergen components) is needed for single-parameter testing.



EUROLINE DPA-Dx Peanut 1 – including the new markers Ara h 5 and Ara h 7



Order no. DP 3511-1601-1 E

Advantages of the EUROLINE DPA-Dx Peanut:

- Differentiation of “true” peanut sensitisation (Ara h 1, Ara h 2, Ara h 3, Ara h 6, Ara h 7) from pollen-associated cross reactions (Ara h 5 and Bet v 1)
- Well-founded risk assessment for severe and systemic reactions (anaphylaxis)
- Targeted nutritional advice in cases of sensitisation to low-risk components (Ara h 5 and Ara h 8/Bet v 1)
- Only small amounts of serum (100–400 µl) required – ideal for paediatrics
- Manual or fully automated processing
- Standardised evaluation using EUROLineScan software



Further literature:

Matricardi PM et al. EAACI Molecular Allergology User's Guide. *Pediatr Allergy Immunol.* 2016 May; 27 Suppl 23:1-250.