

## ALEX® Case Report No. 1

Thomas, 54y, from Austria

### Clinical History

Rhino-conjunctivitis was observed from the age of 5 years on. Asthmatic exacerbations with and without physical exercise were also registered.



Skin Prick Testing in 1976 showed sensitizations against various grass and tree pollen, and against cat dander. Aside from symptomatic treatment with inhalative corticosteroids and antihistamines an allergen specific immunotherapy (AIT) was initiated in 1977 against birch- and grass pollen. Respiratory symptoms improved significantly after completion of AIT, especially the asthmatic episodes.

### Family History

Both father and grandfather are/were allergic and suffered from rhino-conjunctivitis.

### Present situation (2018)

Thomas observed allergy-like symptoms when in the car or in households with cats and dogs, and near horses. Recent skin prick testing revealed sensitizations to pollen from trees, grasses and weeds. Further sensitizations were found for cat-, dog- and horse dander, as well as house dust mites.

As AIT against animal dander and various pollen is considered as a treatment option, an ALEX test was requested by Thomas' allergist.

### ALEX Results\*

Allergen Source	Allergen	Biochemical Designation	IgE Level [kU <sub>A</sub> /L]
Rye grass pollen	Lol p 1	β-Expansin	8.55
Thimothy grass pollen	Phl p 1	β-Expansin	7.91
	Phl p 2	Expansin	8.20
	Phl p 5	Grass group 5/6	27.31
	Phl p 6	Grass group 5/6	7.61
	Phl p 7	Polcalcin	7.89
Alder pollen	Aln g 1	PR-10	11.29
Ash pollen	Fra e 1	Ole e 1-family	13.82
Birch pollen	Bet v 1	PR-10	24.91
Hazel pollen	Cor a 1.0103	PR-10	4.31
Olive pollen	Ole e 1	Ole e 1-family	12.01
Alternaria alternata	Alt a 1	Alt a 1-family	3.26
House dust mite	Der p 1	Cysteine protease	15.09
	Der p 2	NPC2-family	5.08
	Der p 23	Chitinase class III	2.37
Cat dander	Fel d 1	Uteroglobin	12.52
Dog dander	Can f 1	Lipocalin	0.66

Horse dander	Equ c 1	Lipocalin	0.54
Hazel nut	Cor a 1.0401	PR-10	2.43
Peanut	Ara h 8	PR-10	0.82
Soybean	Gly m 4	PR-10	2.35

\* For convenience extract results are not shown, if a corresponding component was positive.

## Interpretation

- The high IgE-levels against the major allergens from tree and grass pollen correspond well to clinical symptoms described by the patient.
- The sensitization against grass pollen is confirmed as genuine by the positive signals to Lol p 1, Phl p 2, Phl p 5 and Phl p 6 – an AIT could be helpful.
- Phl p 7 demonstrates that cross-reactivity to other grass-, weed- or tree-pollen is likely.
- The sensitizations against tree pollen are mostly caused by Bet v 1 and its related allergens from Alder (Aln g 1) and Hazel (Cor a 1.0103). Ash and Olive pollen also showed positive results against the major allergens Fra e 1 and Ole e 1.
- Ash and Olive are from a different botanical family than Alder, Birch and Hazel.
- The pollination period for Birch and Ash are overlapping.
- Olive pollen can induce symptoms, if the patient visits Southern Europe from end of April to mid-June (pollination period).
- AIT against Ash or Olive could be helpful.
- Alternaria alternata spores are present in high concentrations during summer, during the same time as some grass and weed pollen – an AIT could be helpful.
- House dust mite allergens Der p 1, 2 and 23 demonstrate a sensitization to the major allergens from this source. As the symptoms were described accordingly - an AIT could be helpful.
- Furry animal allergens Fel d 1 (cat), Can f 1 (dog) and Equ c 1 (horse) are able to cause respiratory symptoms as described by the patient. Before an AIT is considered contact to pets should be avoided.
- The sensitization to PR-10 allergens like Ara h 8 (Peanut), Cor a 1.0401 (Hazelnut) and Gly m 4 (Soy) originate in the primary sensitization to Bet v 1. Gly m 4 from soy can cause severe reactions, if the consumed soy product is not heavily processed and consumed in larger quantities (e.g. soy milk). Other PR-10 food allergens are usually not able to cause severe allergic symptoms.

## Summary

- Thomas skin test results were confirmed, and the responsible allergens were detected on the molecular level. The patient would be suitable candidate for AIT against various grass and tree pollen, as genuine sensitizations were detected. The positive skin test results for weed pollen is caused by the sensitization against Polcalcin (Phl p 7), which is a highly cross-reactive allergen.
- Further possible AIT is indicated for house dust mite (if encasings do show the desired effect), Alternaria and possibly against furry animals (avoidance would be the first therapeutic step), as in all sources the major allergen is positive.
- The sensitization against Gly m 4 from soy could cause severe reactions, if soy is consumed in higher doses and the soy product is not heavily processed (e.g. soy milk).