

# Comparison of two methods for measuring IgE to a panel of partly molecular based hymenoptera allergens



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## Background:

Diagnostic tests in patients with Hymenoptera venom allergy are frequently positive to venoms of both honey bee and wasp (*Vespula*). Component-resolved analysis with recombinant species-specific major allergens may help to distinguish true double sensitization from cross-reactivity. Detection of specific serum IgE is one of the key diagnostic features. We compared two different methods, *Fluoroenzymeimmunoassay* (ImmunoCAP®, from Thermo Fisher Scientific, INOVA ) and immunoblot based test (EUROLINE®, provided by Euroimmune).

## Patients, Materials and Methods:

Sera of patients with allergy to honey bee (26 patients) and wasp (27) venoms were compared. All patients suffered from clinically relevant insect venom allergy and had positive intradermal tests to the relative insect. As allergens, honey bee (i1), wasp (i3), rApi m 1 (i208), rVes v 1 (i211) and rVes v 5 (i209) were compared. Further allergens on the EUROLINE profile were rApi m 2 (i213) and rApi m 10 (i217, i216 in EUROLINE) as well as a CCD-marker. The tests were performed according to the manufacturers' instructions. Comparisons were done in CAP and EAST classes. Statistical calculations were done using concordance of classes of specific IgE concentrations and correlation was calculated with Pearson's coefficient.

Comparison of honey bee allergens										Fst r = 0.713		r = 0.84			
Number	IgE honey bee (i1)	i1 CAP	Class	i1 Blot	Class	i208 CAP	Class	i208 Blot	Class	i209 CAP	Class	i211 CAP	Class	CCD	Class
10020442	0.60	4.0	0.30	1	0.3	1	0.30	0	0.30	0	0.30	0	0.30	0	0.30
10020443	0.40	1.0	0.1	0	0.1	1	0.30	0	0.30	0	0.30	0	0.30	0	0.30
10020444	4.0	31.0	1.00	1	1.0	1	0.30	0	0.30	0	0.30	0	0.30	0	0.30
10020445	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020446	0.20	0.10	0.02	0	0.02	3	3.0	3	0.30	0	0.30	0	0.30	0	0.30
10020447	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020448	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020449	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020450	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020451	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020452	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020453	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020454	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020455	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020456	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020457	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020458	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020459	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020460	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020461	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020462	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020463	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020464	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020465	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020466	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020467	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020468	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020469	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020470	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020471	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020472	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020473	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020474	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020475	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020476	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020477	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020478	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020479	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020480	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020481	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020482	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020483	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020484	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020485	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020486	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020487	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020488	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020489	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020490	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020491	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020492	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020493	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020494	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020495	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020496	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020497	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020498	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020499	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020500	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020501	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30
10020502	0.40	0.20	0.05	0	0.05	2	1.1	2	0.30	1	0.30	0	0.30	0	0.30

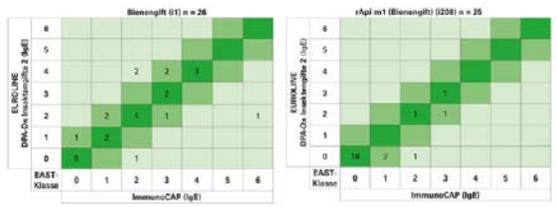
## Laboratory findings:

A combined pattern of various allergens did show increased sensitivity. Adding rApi m 10 on a regular base did increase the detection rate and led to an added value for sensitivity. Sensitivity was further increased by using rApi m 2 on the EUROLINE test. **Concordance** was 85% for honey bee and 96% for rApi m 1 (+/- 1 EAST/CAP class). Concordance was 93% for wasp (i3), 86% for rVes v1 and 96% for rVes v 5.

**Correlation** calculated with **Pearson's coefficient** based on absolute values were for **honey bee allergens** for **i1**  $r = 0.713$  ( $p < 0.001$ ) and for **Api m 1 (i208)**  $r = 0.84$  ( $p < 0.001$ ). For **wasp allergens**, correlation was for **i3**  $r = 0.861$  ( $p < 0.001$ ), for **rVes v 1**  $r = 0.6$  ( $p = 0.001$ ) and for **rVes v 5**  $r = 0.858$  ( $p < 0.001$ ). However, in lower levels of specific IgE some important discrepancies were found, for both methods analyzed.

## Conclusions:

Measuring panels of IgE showed comparable results, with minimal but possibly in single cases important differences in sensitivity and specificity. Correlations between the 2 investigated methods were significant. A panel of allergens however offers several advantages for a precise evaluation in hymenoptera venom allergic patients.



Die Ergebnisse des EUROLINE DPA-Dx Insektengifte 2 (IgE) von EUROIMMUN stimmen zu 85% (i1) und 96% (i208) mit denen der Phadia ImmunoCAP-Systemen überein – zulässige Abweichung: ±1 EAST-Klasse.

