Technical and clinical evaluation of a fully automated Reversed Enzyme Allergo Sorbent Test (REAST) using liquid biotinylated allergens

I. Duyan, M. Mahler, M. Hoff, M. Fooke
Dr. Fooke Laboratorien GmbH, Neuss, Germany

Aim: The REAST (Reversed Enzyme Linked Allergo Sorbent Test, Dr. Fooke) represents a modern immunoassay for the detection of sIgE which is based on immobilized anti-IgE in combination with liquid biotinylated allergens. In a recent study it was shown by Kleine-Tebbe et al., that the overall results of the REAST and the ImmunoCAP® were in a good agreement. The aim of this study was to further compare both methods in terms of technical and clinical correlation.

Methods: Serum samples from atopic individuals were tested for sIgE by ImmunoCAP® and by REAST. A second panel of samples from patients with clinically relevant sensitization to bee and / or wasp venom was tested for sIgE using both methods to examine the clinical usefulness of the tests.

Results and findings: sIgE concentrations measured by REAST and by ImmunoCAP® were comparable and statistically correlated for all allergens tested. Moreover, the clinical sensitivity for sIgE to i1 was slightly higher for the ImmunoCAP® but significantly lower for sIgE to i3. Technical evaluation of the instrument used for the REAST (AP22, DAS, Italy) demonstrated low variations between different instruments and also to the manual test procedure. Further advantages were a short hands on time, as well as a high through-put rate.

Conclusion: We conclude that the REAST combined with the AP22 represents a useful tool for the detection of sIgE.

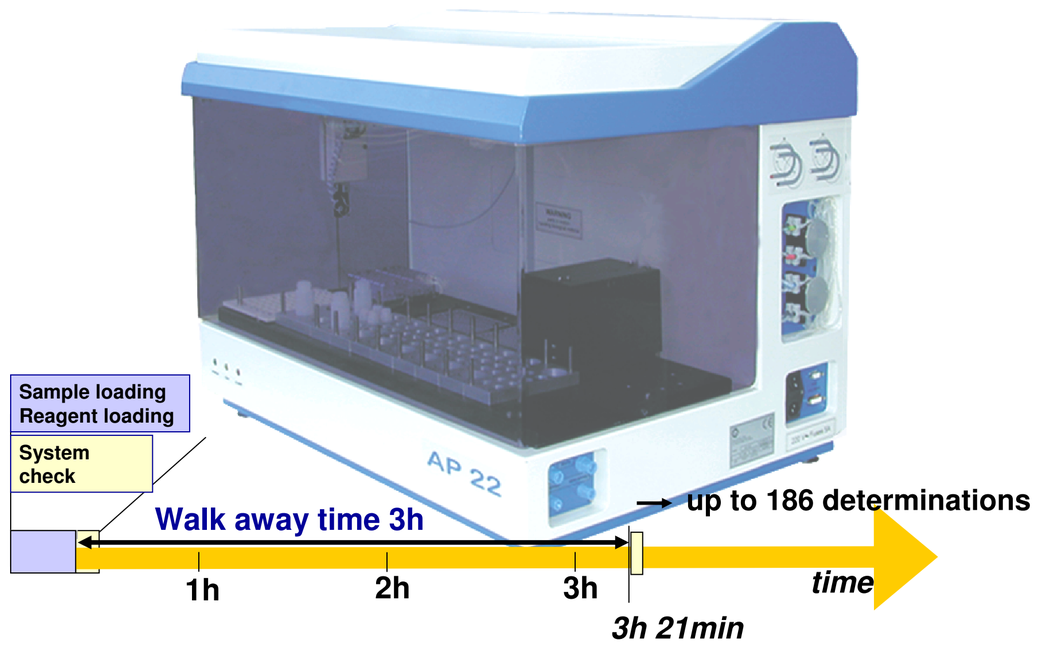
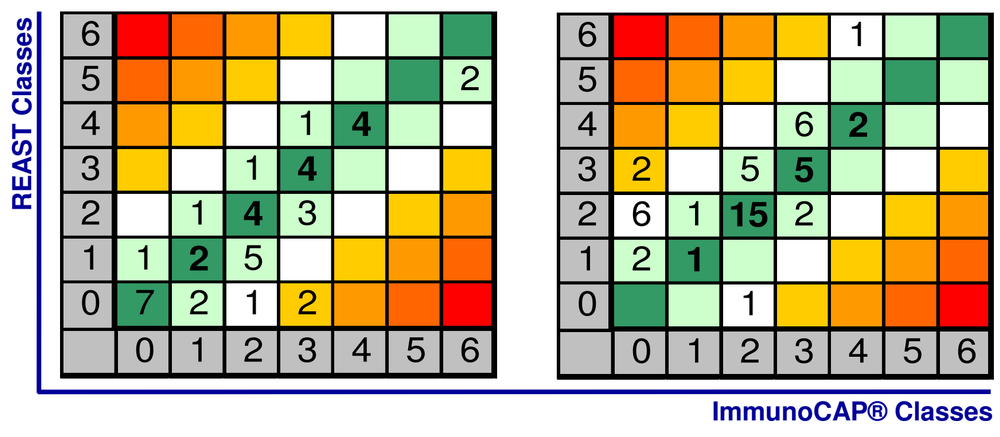


Figure 2 Hands on time and productivity of the AP22 in combination with REAST.



	ImmunoCAP®	REAST
No. positive	32	28
No. negative	8	12
Sensitivity %	80	70

	ImmunoCAP®	REAST
No. positive	39	48
No. negative	10	1
Sensitivity %	80	98

Figure 3 Results of the comparative study for sIgE to i1 and i3. Samples from patients with clinically relevant sensitisation to bee and / or wasp venom were tested for specific IgE to i1 (n=40) and / or i3 (n=49). Clinical sensitivity in % was calculated for both allergens and both methods.

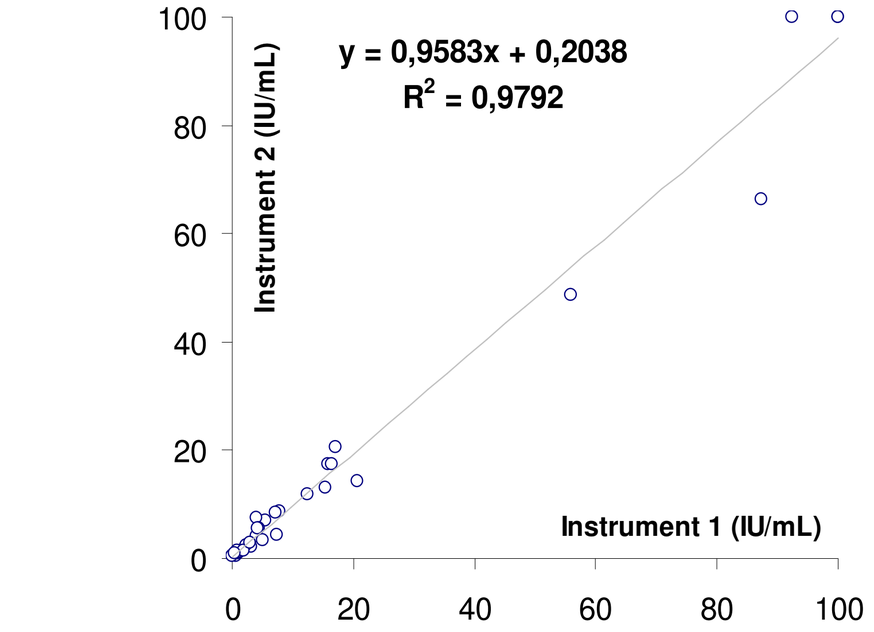


Figure 4 Correlation between the results obtained with two instruments. 40 serum samples tested by two instruments showed a high degree of correlation (R^2 = 0.98). Correlation of the results to manual test procedure yielded comparable values (R^2 = 0.97).

Table 1 Results of the technical correlation between REAST and ImmunoCAP®.

Allergen	Code	No. of samples	R^2 *	Concordance %	Concordance +/- 1 Class %
D. pteronyssinus	d1	40	0.5703	30.0	82.5
D. farinae	d2	20	0.7091	45.0	75.0
Timothy grass	g6	17	0.6173	47.1	64.7
Cultivated Rye	g12	31	0.7301	61.3	87.1
Velvet grass	g13	40	0.8321	50.0	75.0
Bee venom	i1	40	0.9619	52.5	92.5
Wasp venom	i3	49	0.6221	46.9	79.6
Alder	t2	30	0.8414	23.2	90.0
Birch	t3	40	0.7071	57.5	90.0

* R^2 based on IU/mL

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Dr. Fooke Laboratorien GmbH - Mainstraße 85 - 41469 Neuss – Germany, Phone: + 49 (0) 2137 1005-0 - Fax: + 49 (0) 2137 12409 - email: information@fooke-labs.de