

# Analytic precision and accuracy of commercial immunoassays for specific IgE: Establishing a standard

Williams PB et al, *J Allergy Clin Immunol* 2000;105:1221-30

## BACKGROUND

Different laboratory assays are used to detect and measure specific IgE antibodies. *No standard exist to assess their analytic performance.*

## OBJECTIVE

To analyze reported specific IgE results from different laboratories on the same serum samples for their accuracy and precision. *Are results from different laboratories interchangeable?*

## CONCLUSIONS

One commercial system (Pharmacia CAP System™) used in two different laboratories performed nearly as well as the ideal standard.

Four of the laboratories-assays for specific IgE antibodies demonstrated substandard overall performance with multiple instances of poor precision and accuracy, particular for certain allergens, such as weeds and molds.

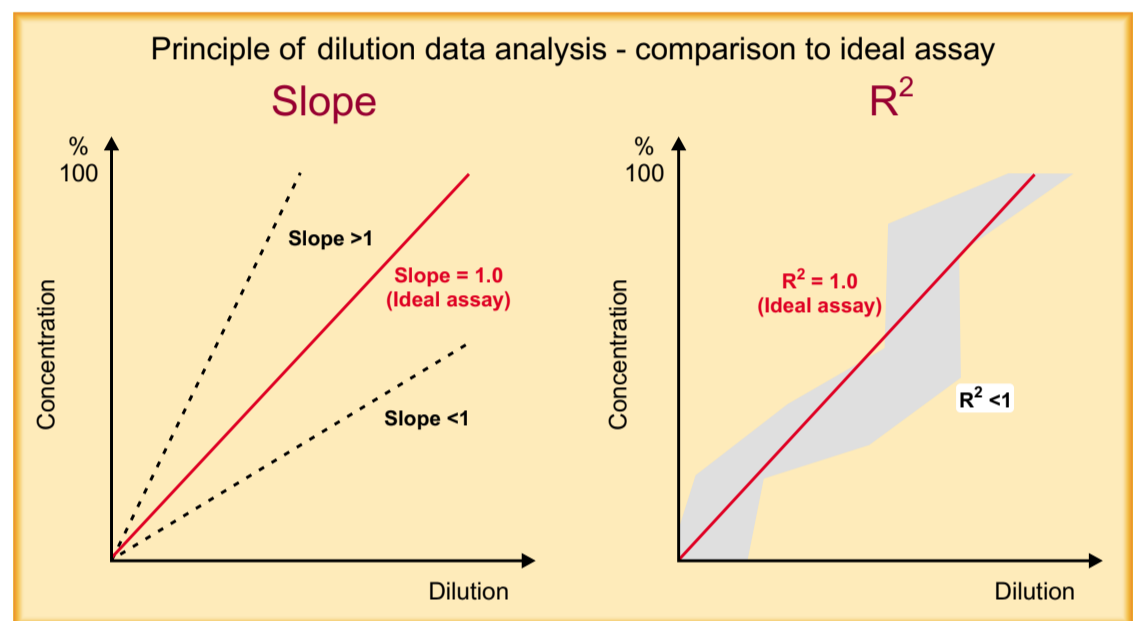
## METHODS

### 6 Commercial Laboratories

- 1 DPC AlaSTAT™
- 2 Pharmacia CAP System™
- 3 Hycore/Hycore license Modified RAST

### Precision - Accuracy

- 26 serum samples with variable levels of specific IgE were sent blinded to 6 laboratories on three different occasions over a six week period
- Each sample was assessed for specific IgE to 17 different allergens (mite, epithelium, pollen, mold)
- 6 of the 26 samples were presented in a dilution series (5 times 2 fold)
- Dilution recovery results were compared with a theoretic ideal assay with slope of 1.0 as the reference
- 12,708 results compared



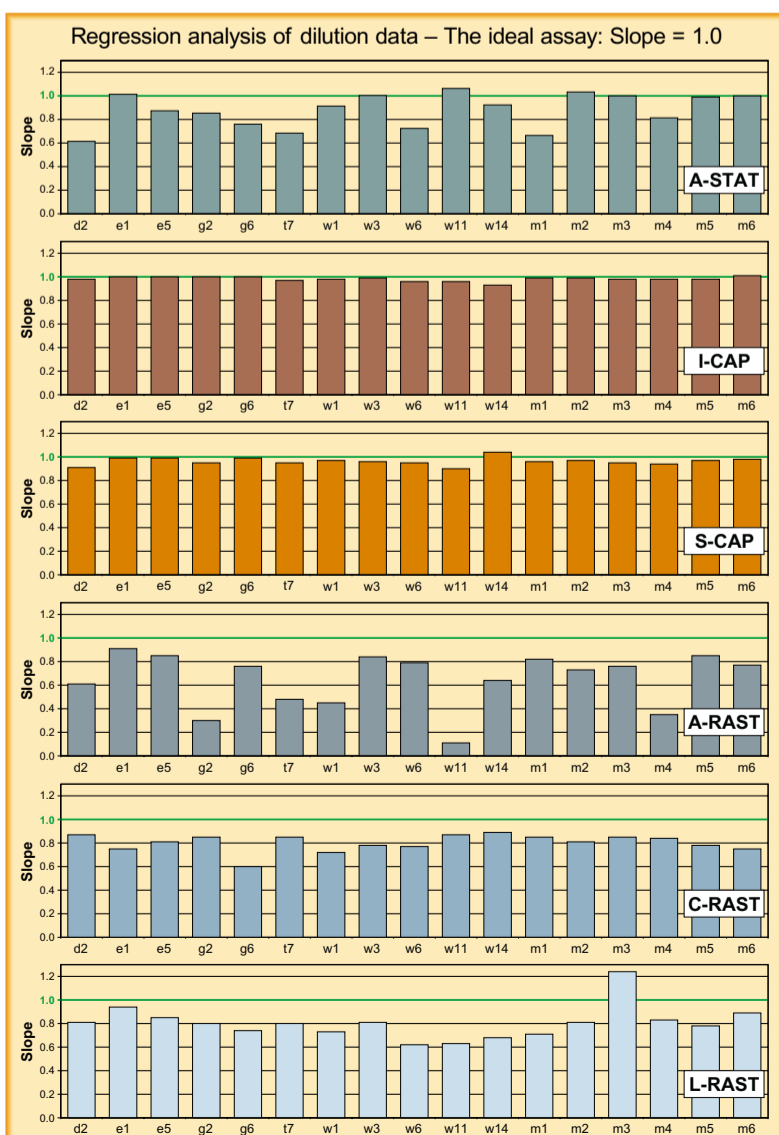
## RESULTS

### Abbreviations used

**A-STAT:** AlaSTAT by Allercare (Diagnostic Products Corporation)  
**I-CAP:** Pharmacia CAP System by IBT Reference Laboratory  
**S-CAP:** Pharmacia CAP System by SmithKline Beecham Laboratories  
**A-RAST:** Modified RAST by Allergy Testing Laboratories (license from Hycore Biomedical)

**C-RAST:** Modified RAST by Commonwealth Medical Laboratory (Hycore Biomedical)

**L-RAST:** Modified RAST by Laboratory Corp of America (license from Hycore Biomedical)



Lab precision summary for positive readings (CV) Nondilution samples						
Allergen	A-STAT	I-CAP	S-CAP	A-RAST	C-RAST	L-RAST
d2 <i>Dermatophagoides farinae</i>	17.7%	8.8%	11.2%	17.7%	23.7%	9.9%
e1 Cat Dander	18.8%	11.3%	14.1%	16.8%	5.3%	9.7%
e5 Dog Dander	19.7%	10.3%	7.4%	17.6%	11.0%	15.4%
g2 Bermuda Grass ( <i>Cynodon dactylon</i> )	28.7%	11.6%	11.1%	19.7%	8.2%	14.2%
g6 Timothy Grass ( <i>Phleum pratense</i> )	22.8%	9.4%	13.9%	16.9%	5.4%	14.0%
t7 White Oak ( <i>Quercus alba</i> )	16.5%	7.0%	11.6%	17.4%	10.5%	12.9%
w1 Short Ragweed ( <i>Ambrosia elatior</i> )	24.0%	8.7%	6.5%	18.2%	7.5%	14.1%
w3 Giant Ragweed ( <i>Ambrosia trifida</i> )	28.2%	11.8%	12.0%	24.6%	10.0%	9.9%
w6 Mugwort Sage ( <i>Artemisia vulgaris</i> )	49.1%	12.6%	10.5%	22.0%	7.8%	12.9%
w11 Russian Thistle ( <i>Salsola kaili</i> )	27.0%	8.1%	8.5%	16.3%	16.0%	14.8%
w14 Rough Pigweed ( <i>Amaranthus retroflexus</i> )	17.8%	8.1%	13.1%	16.3%	23.5%	15.0%
m1 <i>Penicillium Notatum</i>	41.4%	8.5%	11.0%	20.8%	15.1%	17.2%
m2 <i>Cladosporium herbarum</i>	32.1%	10.4%	10.3%	26.1%	15.3%	11.9%
m3 <i>Aspergillus fumigatus</i>	26.8%	8.2%	10.7%	20.7%	14.9%	11.5%
m4 <i>Mucor racemosus</i>	27.2%	11.2%	9.4%	21.7%	28.4%	31.3%
m5 <i>Candida albicans</i>	25.7%	11.2%	12.5%	20.4%	15.7%	17.0%
m6 <i>Alternaria tenuis/alternata</i>	18.3%	10.8%	10.6%	23.4%	9.6%	8.5%
<b>Average for lab</b>	<b>27.5%</b>	<b>9.8%</b>	<b>10.8%</b>	<b>20.3%</b>	<b>13.4%</b>	<b>14.7%</b>

