

Food Allergy Diagnosis and Clinical Assessment



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Clinician's point of view: food allergy and diagnosis



Self-perceived FA
< 35%



SE
<10%-
>90%

sensitisation FA:
< 22%



“true” FA
1-10 %

case history

skin testing
pricktest with extracts/native

in vitro testing
measurement of sIgE

clinical relevance
oral provocation





mild-moderate



moderate-severe

Anaphylaxis

Anaphylaxis is highly likely when any one of the following three criteria is fulfilled:

1

Sudden onset of an illness (minutes to several hours), with involvement of the skin, mucosal tissue, or both (e.g. generalized hives, itching or flushing, swollen lips-tongue-uvula)



AND AT LEAST ONE OF THE FOLLOWING:



Sudden respiratory symptoms and signs (e.g. shortness of breath, wheeze, cough, stridor, hypoxemia)



Sudden reduced BP or symptoms of end-organ dysfunction (e.g. hypotonia [collapse], incontinence)

OR

2

Two or more of the following that occur suddenly after exposure to a *likely allergen or other trigger** for that patient (minutes to several hours):



Sudden skin or mucosal symptoms and signs (e.g. generalized hives, itch-flush, swollen lips-tongue-uvula)



Sudden respiratory symptoms and signs (e.g. shortness of breath, wheeze, cough, stridor, hypoxemia)



Sudden reduced BP or symptoms of end-organ dysfunction (e.g. hypotonia [collapse], incontinence)



Sudden gastrointestinal symptoms (e.g. crampy abdominal pain, vomiting)

OR

3

Reduced blood pressure (BP) after exposure to a *known allergen*** for that patient (minutes to several hours):

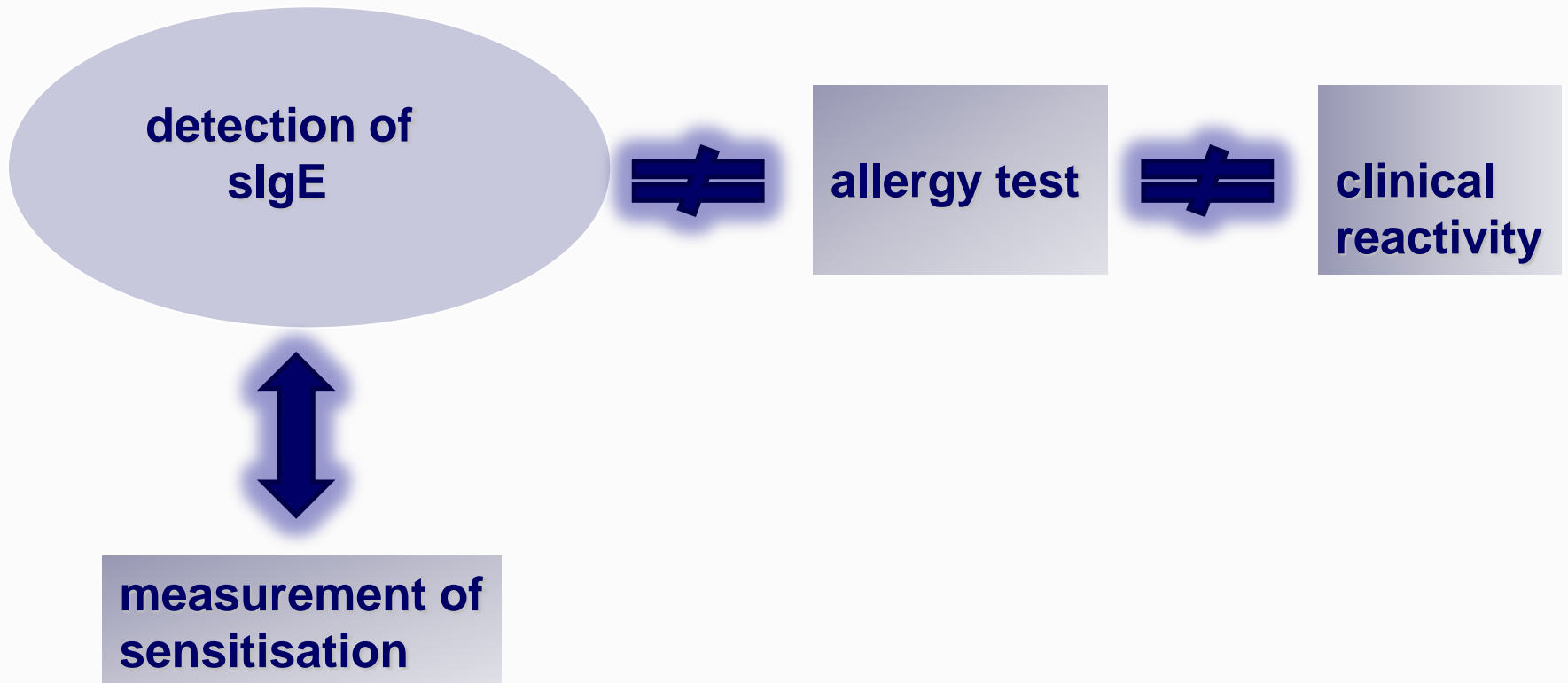


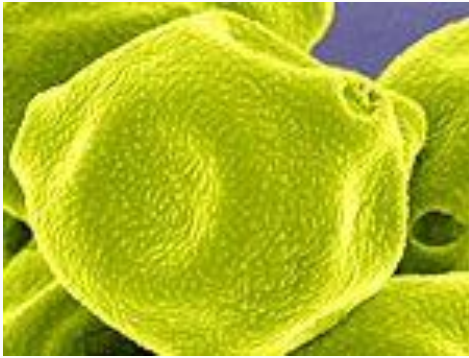
Infants and children: low systolic BP (age-specific) or greater than 30% decrease in systolic BP***



Adults: systolic BP of less than 90 mm Hg or greater than 30% decrease from that person's baseline

Detection of sIgE





Pollen related FA

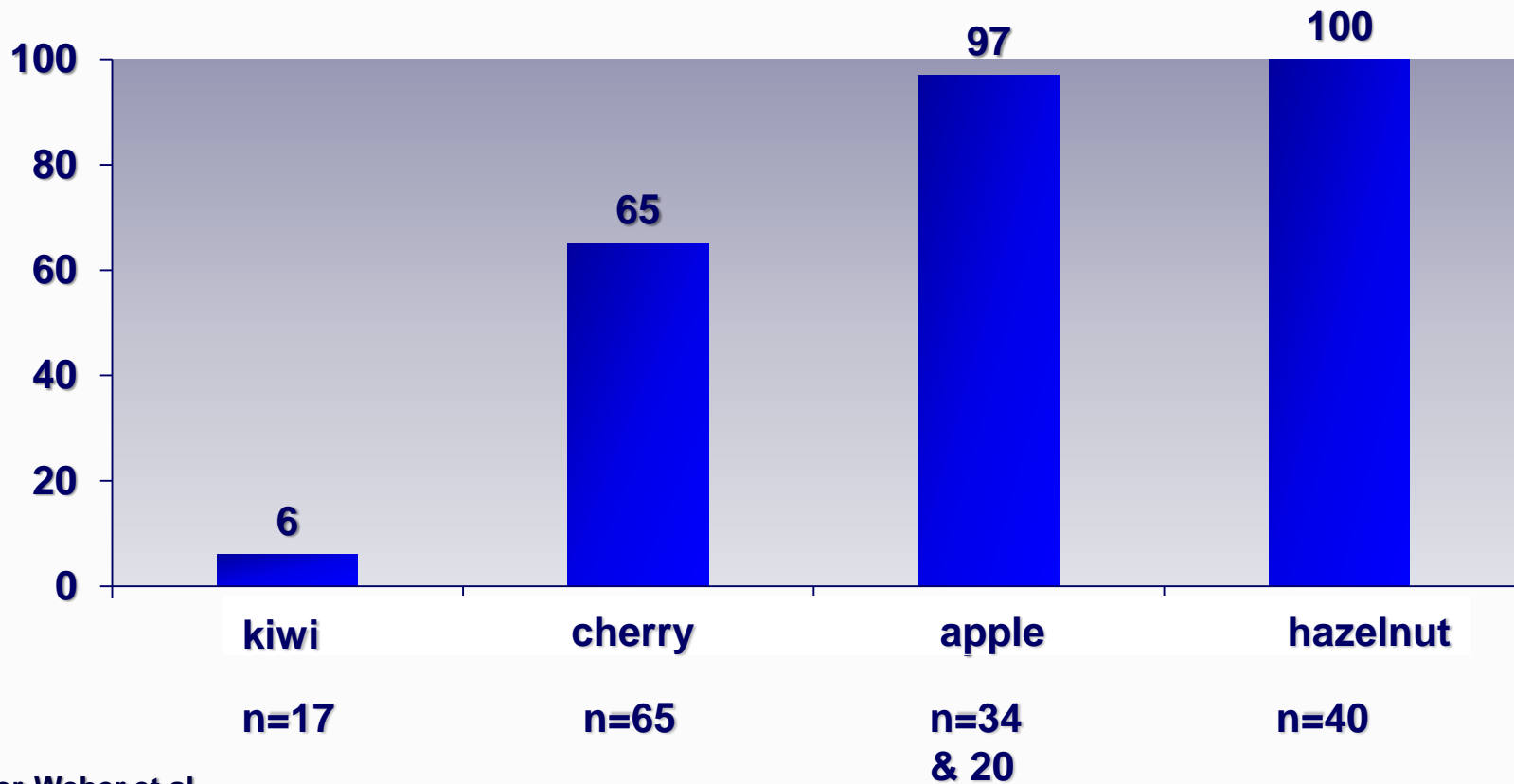
- **Europe: birch/mugwort**
- **Japan: alder/birch**
- **USA: birch/ragweed**
- **China: mugwort**

Primary FA

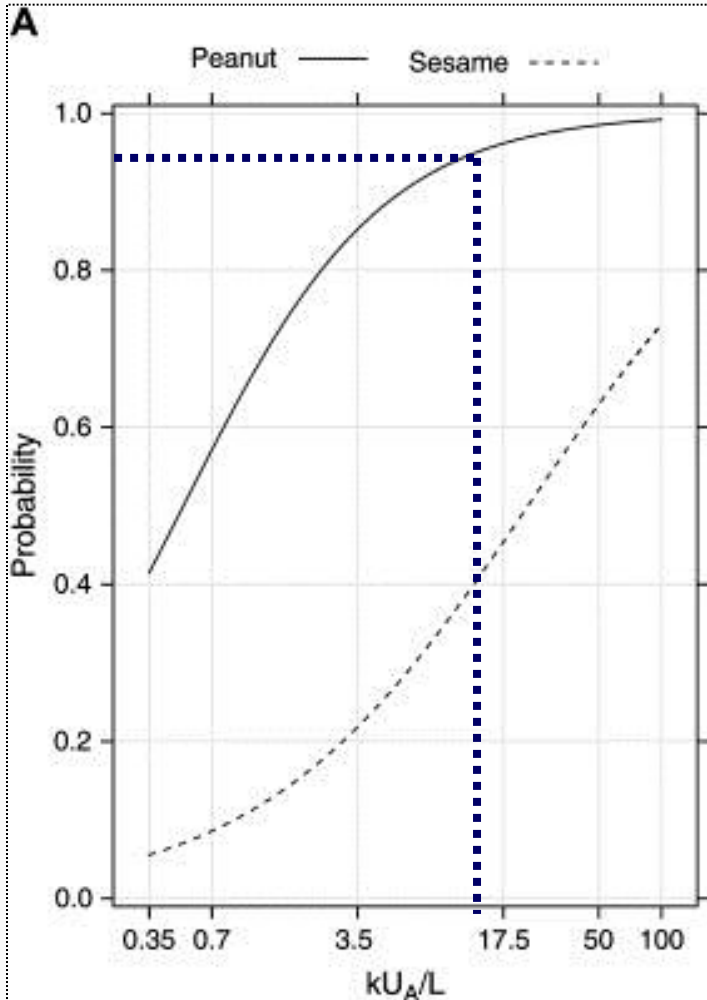
**low sensitivity (in part)
of extract based diagnosis**

**high sensitivity (in part)
of extract based diagnosis**

Sensitivity sIgE determination (CAP) in birch pollen related food allergy



Diagnosis of peanut allergy



| | sensitivity (CAP) |
|-----------------------------------|--------------------------|
| Sampson et al. 1997 | 97% |
| Eller et al., in preparat. | 94% |

| | 90% predicted probability | 95% predicted probability |
|--------------------|----------------------------------|----------------------------------|
| peanut sIgE | 6.0 kU/l | 13.0 kU/l |

Diagnosis of food allergy: sIgE

Suggested predictive values of sIgE and SPT for selected food allergens

| | ~50% react (62) | ~95% react (> 2 years of age) (61, 62) | ~95% react (≤ 2 years of age) (63–65) |
|--------|--|---|---|
| Milk | sIgE = 2 kU _A /l | sIgE = 15 kU _A /l SPT = 8-mm wheal ^A | sIgE = 5 kU _A /l SPT = 6-mm wheal |
| Egg | sIgE = 2 kU _A /l | sIgE = 7 kU _A /l SPT = 7-mm wheal | sIgE = 2 kU _A /l SPT = 5-mm wheal |
| Peanut | sIgE = 2 kU _A /l (convincing history) sIgE = 5 kU _A /l (unconvincing history) | sIgE = 14 kU _A /l PST = 8-mm wheal | – SPT = 4-mm wheal |

^ASPT. dependent upon extracts and technique utilized.

higher levels of sIgE and larger wheal size associated with increased likelihood of allergic reaction for some food

they still lack of precision

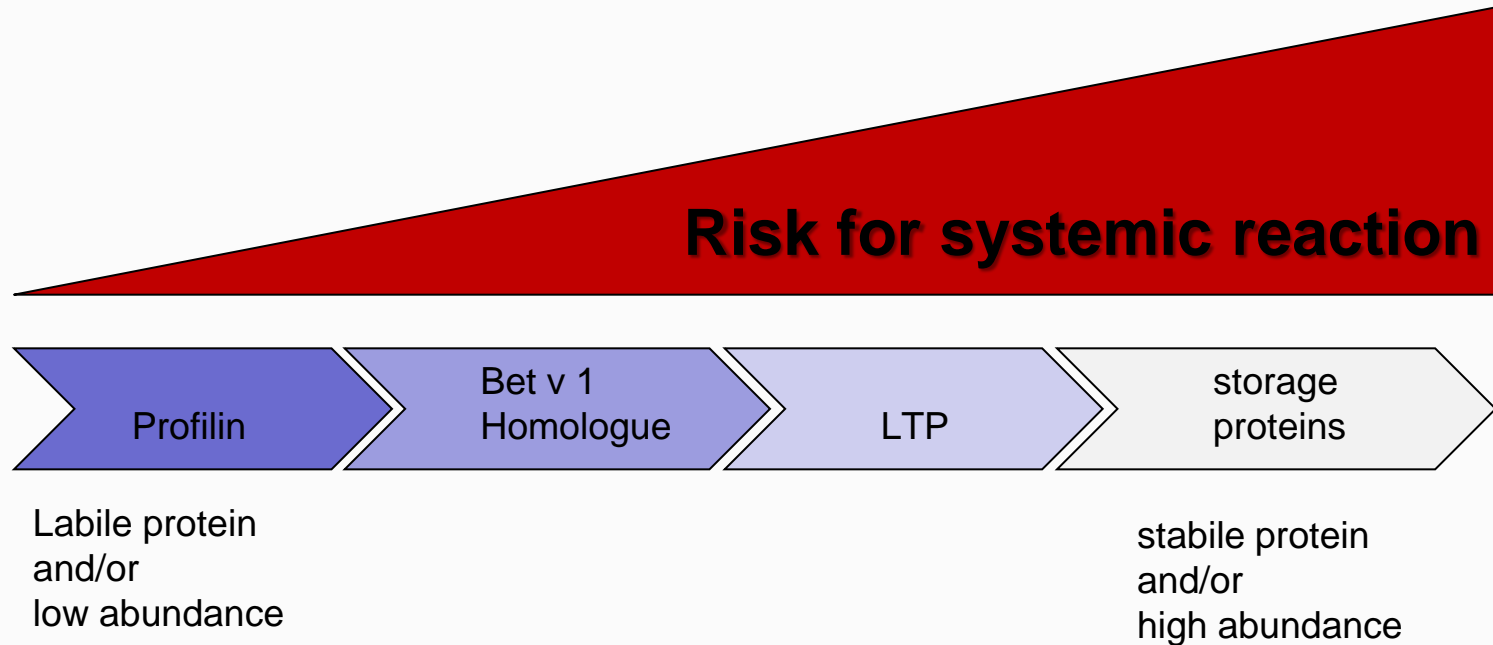
do not predict severity of allergic reaction

Component resolved diagnosis (CRD)

measurement of sIgE to single allergens derived from one allergenic source = food



component/allergen-related diagnosis (CRD)

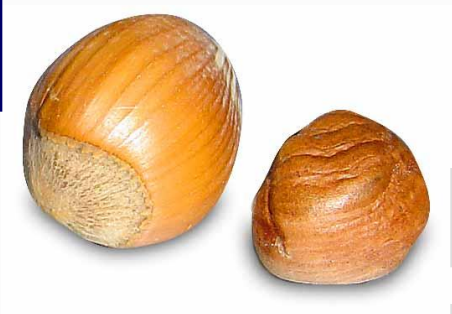




Bet v 1
Bet v 2

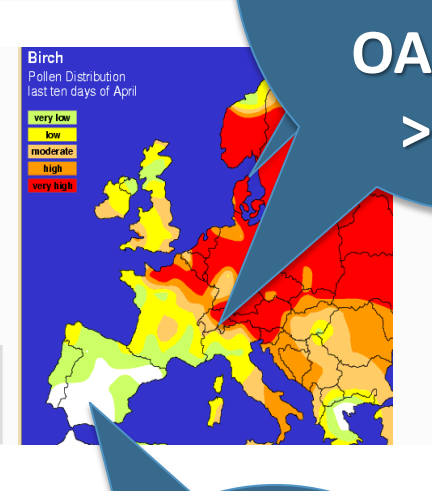


Cor a 1 (Bet v 1 homologous)
Cor a 2 (profilin)



Cor a 8 (LTP)

storage-proteins



n=40
Cor a 1
95-100%
OAS only
>90%

n=17
Cor a 8 71%
systemic
41%



Bet v 1 - Gly m 4



**Gly m 5: Beta-Conglycinin
Gly m 6: Glycinin**

n = 30; DBPCFC positive

**severe
systemic reaction**



**mild allergic
reaction**

odds ratio:

Gly m 4: <1

Gly m 5: 5

Gly m 5/6: 12

Kiwi allergy across Europe

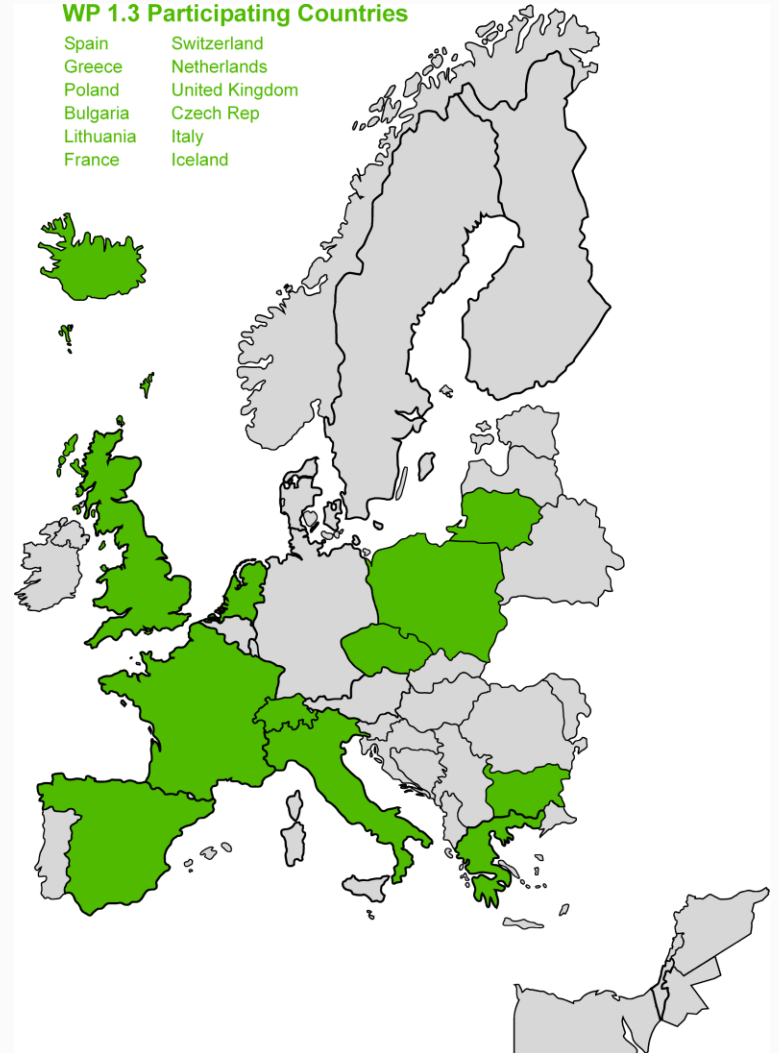
Thuy-My et al., J Allergy Clin Immunol 2012

European kiwi allergics

- median age 31, 1-87y
- n= 311

WP 1.3 Participating Countries

| | |
|-----------|----------------|
| Spain | Switzerland |
| Greece | Netherlands |
| Poland | United Kingdom |
| Bulgaria | Czech Rep |
| Lithuania | Italy |
| France | Iceland |

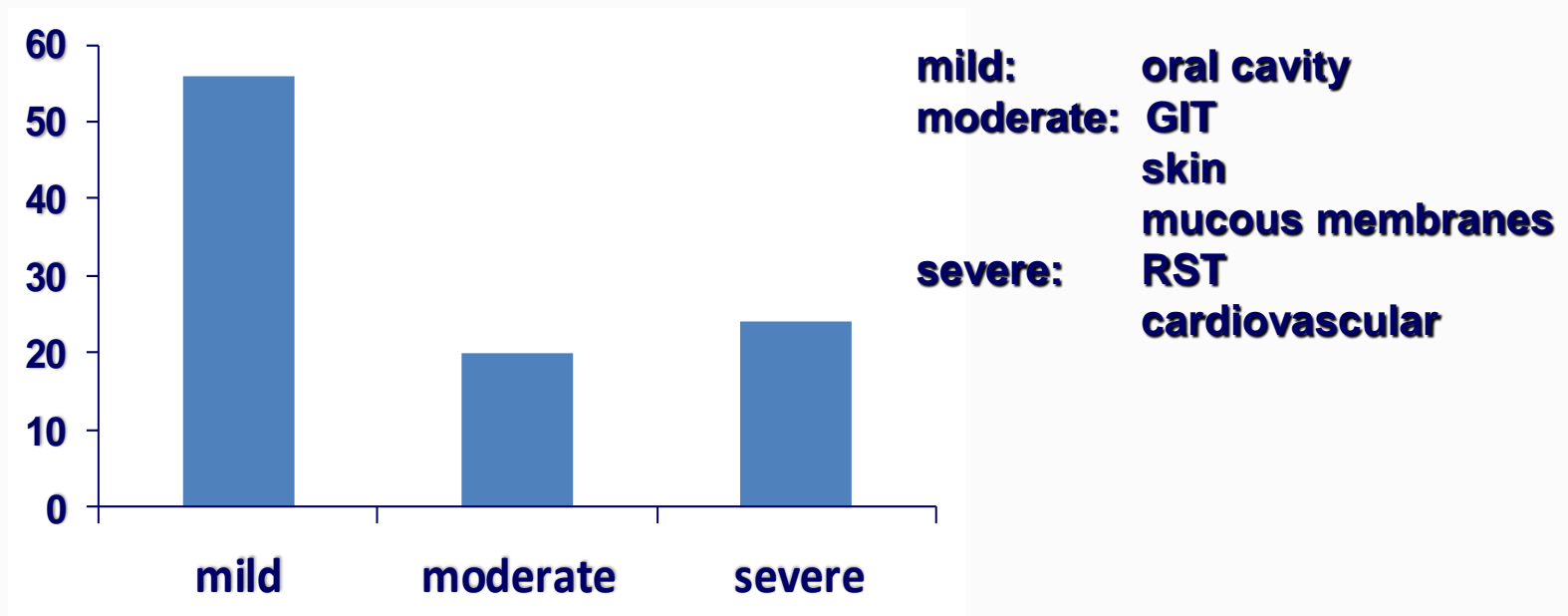


CRD in Kiwi allergy

- Act d 1 Actinidin
- Act d 2 Thaumatin
- Act d 3 40 kDa Allergen
- Act d 4 Cystatin
- Act d 5 Kiwellin
- Act d 6 Pectin Methylesterase Inhibitor
- Act d 7 Pectin Methylesterase
- Act d 8 Bet v 1 homologous
- Act d 9 Profilin
- Act d 10 LTP
- Act d 11 Ripening related protein

Kiwi allergy across Europe: severity of reaction

Thuy-My et al., J Allergy Clin Immunol 2012



OR
Act d 1: 3.98
IS: 5.6

summary

Diagnosis of food allergy

- case history
- sIgE
- provocation

Severity of clinical response

- pathogenesis
- allergens LTP/ storage proteins/ actinidin
- dose/amount of food ingested
- cofactors

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