

# NEW HORIZONS — ALLERGY —

## *Natural rubber latex allergens: Characterization and evaluation of their allergenic capacity*

Join us exploring the frontiers of allergy research

### Clinical background

In the last few years many efforts have been made to reduce the incidence of latex allergy. For this purpose the identification of the major latex allergens and their recombinant production and the determination of specific sensitization profiles for different patient groups (dependent on the various routes of exposure) are useful steps towards the understanding of latex allergy and its management. The use of well defined and standardized NRL extracts and/or purified proteins are the next objectives. In the diagnosis of NRL allergy, non-purified latex has practical utility as a test reagent and has generated useful research information. However, there are limitations in adopting it for use as a reference material, as variations in allergen content in latex due to different factors have been described. In this context, a test reagent formulated with appropriate proportions of purified allergens (native or evaluated recombinant latex allergens) has the advantages of better test sensitivity and reproducibility. Determination of an allergen protein profile of IgE antibodies may be a valuable strategy to enhance the diagnostic repertoire in certain cases.

### Immunological and clinical properties of characterized latex allergens

| Latex allergen* | Significance as Latex allergen                             | Significance concerning cross-reactivity                                                                                       | IgE-binding prevalence of the allergen                    | Documented on k82 Latex ImmunoCAP™ |
|-----------------|------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|------------------------------------|
| Hev b 1         | <b>High</b> (especially in spina bifida patients)          | <b>Not observed yet</b>                                                                                                        | HCW: 55/105 (52%)<br>SB: 56/ 69 (81%)                     | <b>++</b>                          |
| Hev b 2         | <b>Medium</b>                                              | <b>Medium</b>                                                                                                                  | HCW: 20/ 31 (65%)<br>SB: 7/ 13 (54%)                      | <b>++</b>                          |
| Hev b 3         | <b>High</b> (especially in spina bifida patients)          | <b>Not observed yet</b>                                                                                                        | HCW: 13-20%<br>SB: 76-78%                                 | <b>++</b>                          |
| Hev b 4         | <b>Not determined</b>                                      | <b>Not observed yet</b>                                                                                                        | No clear results                                          | <b>nt</b>                          |
| Hev b 5         | <b>High</b> all risk groups:<br>HCW, spina bifida, atopics | <b>Not observed yet</b><br>(structure homology with a kiwi fruit protein)                                                      | HCW: 68-92%<br>SB: 33-56%                                 | <b>++</b>                          |
| Hev b 6.01      | <b>High</b> all risk groups:<br>HCW, spina bifida, atopics | <b>High</b><br>(especially with banana, kiwi, avocado)                                                                         | LAP: 15/20 (75%)<br>LAP: 24/29 (83%)                      | <b>++</b>                          |
| Hev b 6.02      | <b>High</b> all risk groups:<br>HCW, spina bifida, atopics | <b>High</b><br>(especially with banana, kiwi, avocado etc.;<br>main IgE-binding epitope)                                       | LAP: 24/ 43 (56%)<br>HCW: 48/ 64 (75%)<br>SB: 3/ 11 (27%) | <b>++</b>                          |
| Hev b 6.03      | <b>High</b> in context with<br>Hev b 6.01                  | <b>High</b><br>(structure homology to plant stress proteins)                                                                   | LAP: 3/20 (15%)<br>LAP: 11/ 52 (21%)                      | *                                  |
| Hev b 7.01      | <b>Low-Medium</b>                                          | <b>Unclear</b><br>structural homology to proteins from potato<br>and tomato but no cross-reactivity with banana<br>and avocado | LAP: 4/36 (11%)<br>LAP: 17/ 35 (49%)                      | <b>++</b>                          |
| Hev b 7.02      | <b>Medium only in SB</b>                                   | <b>Unclear</b> see Hev b 7.01                                                                                                  | SB: 15/38 (39.5%)                                         | <b>++</b>                          |
| Hev b 8         | <b>Low</b><br>(profilin is a ubiquitous pan-allergen)      | <b>Medium</b>                                                                                                                  | LAP: 2/19 (11%)<br>HCW: 20-24%<br>SB: 6-12%               | <b>++</b>                          |
| Hev b 9         | <b>Low</b>                                                 | <b>Medium</b> Cross-reactivity with moulds                                                                                     | LAP: 16/110 (15%)                                         | <b>+</b>                           |
| Hev b 10        | <b>Low</b>                                                 | <b>Medium</b><br>Cross-reactivity with moulds                                                                                  | HCW: 0/20, SB: 2/20<br>LAP: 4/15 (27%)                    | <b>++</b>                          |
| Hev b 11        | <b>Low</b>                                                 | <b>High</b><br>Cross-reactivity with fruits and allergens<br>especially hevein-like sequences                                  | LAP: 10/57 (19%)<br>LAP (53 HCW, 5SB):<br>17/58 (29%)     | <b>++</b>                          |
| Hev b 12        | <b>Low</b>                                                 | <b>Medium</b><br>pan-allergen; cross-reactivity with fruits                                                                    | LAP: 9/37 (24%)                                           | *                                  |
| Hev b 13        | <b>High</b>                                                | <b>Not determined yet</b>                                                                                                      | HCWs by SPT: 39/62 (63%)                                  | <b>nt</b>                          |

\*IUIS nomenclature LAP = latex allergic patients,  
HCW = health care workers,  
SB = spina bifida patients

++ Satisfactory amounts on k82 Latex ImmunoCAP (14-4511-01)  
+ Acceptable but low amounts on k82 Latex ImmunoCAP (14-4511-01)  
\* Testing in progress  
nt Not tested/not available

New latex allergen components for IgE antibody testing

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## Product List

### Research tools for clinical applications

| <b>Occupational allergens</b>                                      |             |             |                 |             |
|--------------------------------------------------------------------|-------------|-------------|-----------------|-------------|
| <b>Product – components from latex (<i>Hevea brasiliensis</i>)</b> | <b>Code</b> | <b>Size</b> | <b>Art. No.</b> | <b>Note</b> |
| rHev b 1 (recombinant MBP-fusion protein)                          | Rk215       | 10          | 14-5324-10      | 1           |
| rHev b 2 (recombinant MBP-fusion protein)                          | Rk216       | 10          | 14-5325-10      | 1           |
| rHev b 3 (recombinant MBP-fusion protein)                          | Rk217       | 10          | 14-5326-10      | 1           |
| rHev b 5 (recombinant)                                             | Rk218       | 10          | 14-5327-10      | 1           |
| rHev b 6.01 (recombinant MBP-fusion protein)                       | Rk219       | 10          | 14-5328-10      | 1           |
| rHev b 6.02 (recombinant MBP-fusion protein)                       | Rk220       | 10          | 14-5329-10      | 1           |
| rHev b 8 (recombinant MBP-fusion protein)                          | Rk221       | 10          | 14-5330-10      | 1           |
| rHev b 9 (recombinant MBP-fusion protein)                          | Rk222       | 10          | 14-5331-10      | 1           |
| rHev b 11 (recombinant MBP-fusion protein)                         | Rk224       | 10          | 14-5333-10      | 1           |

| <b>Negative control for recombinant allergens with MBP carrier protein</b> |             |             |                 |             |
|----------------------------------------------------------------------------|-------------|-------------|-----------------|-------------|
| <b>Product</b>                                                             | <b>Code</b> | <b>Size</b> | <b>Art. No.</b> | <b>Note</b> |
| MBP (maltose-binding protein)                                              | Ro213       | 10          | 14-5334-10      | 1           |

Note 1: Analyte Specific Reagents

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