Anti-CCD* Absorbent
Fewer cross reactions – increased specificity

* CCD: Cross-reactive carbohydrate determinants
Antibodies against cross-reactive carbohydrate determinants (anti-CCD IgE antibodies)

Cross-reactive carbohydrate determinants (CCDs) are sugar structures which are attached to proteins during post-translational glycosylation. CCD structures of glycosylated proteins from plants or invertebrates differ from those of human glycoproteins and are therefore immunogenic. At the first contact with a glycosylated allergen, specific IgE antibodies against the protein as well as against the CCD structures are formed (anti-CCD IgE antibodies, fig. right). Due to the high structural similarity of the CCDs of different species, anti-CCD IgE antibodies present cross reactions to glycoproteins from insects, crustaceans and molluscs, plant pollen, fruit and latex.

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Anti-CCD IgE antibodies and their relevance for in vitro allergy diagnostics

Anti-CCD IgE antibodies are detectable in around 25% of allergy patients, but also in non-allergic individuals. They usually do not have any clinical relevance. In extract-based in vitro allergy diagnostics, the occurrence of these antibodies hinders the interpretation of positive results, since it is not possible to distinguish between reactions due to antibodies against peptidic epitopes (1), anti-CCD IgE antibodies (2), or both antibody types (3). With recombinantly produced allergen components, CCD interactions do not occur.

EUROIMMUN’s Anti-CCD Absorbent enables differentiation between the results described above by binding the anti-CCD IgE antibodies present in the serum (fig. right). The use of the absorbent is indicated when antibodies against CCD structures are clearly present in the patient serum (positive CCD band).

Test result 1

- Antibody against peptidic epitopes
  - Negative CCD band
  - Positive allergen bands

Test result 2

- Anti-CCD IgE antibody
  - Positive CCD band
  - Positive allergen band

Test result 3

- Both antibody types
  - Positive CCD band
  - Positive allergen bands

EUROIMMUN’s Anti-CCD Absorbent

- + Anti-CCD Absorbent
  - Negative result
  - Allergic reaction unlikely

- + Anti-CCD Absorbent
  - Persisting positive allergen bands
  - Allergic reaction likely

Case example

By using the Anti-CCD Absorbent from EUROIMMUN, reactions resulting from CCDs are eliminated. This increases the diagnostic specificity and therefore allows assessment of the actual sensitisation status of the patient.

Case example for test result 2

<table>
<thead>
<tr>
<th>Allergen</th>
<th>Concentration</th>
<th>EAST class</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCD</td>
<td>73 kU/l</td>
<td>5</td>
</tr>
<tr>
<td>Crab (f23)</td>
<td>&lt;0.35 kU/l</td>
<td>0</td>
</tr>
<tr>
<td>Potato (f35)</td>
<td>64 kU/l</td>
<td>0</td>
</tr>
</tbody>
</table>

Excerpt from the test evaluation

**Result without Anti-CCD Absorbent**
Positive results for the majority of tested foods.

**Result with Anti-CCD Absorbent**
Negative results for the foods that previously tested positive.

**Conclusion:**
According to the test results obtained without Anti-CCD Absorbent, the patient would need to unnecessarily avoid a large number of foods.

Owing to the use of EUROIMMUN’s Anti-CCD Absorbent, anti-CCD IgE antibodies could be removed and the diagnosis specified. The patient is not sensitised to any of the tested foods.

Case example for test result 3

<table>
<thead>
<tr>
<th>Allergen</th>
<th>Concentration</th>
<th>EAST class</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCD</td>
<td>91 kU/l</td>
<td>5</td>
</tr>
<tr>
<td>Carrot (f31)</td>
<td>&lt;0.35 kU/l</td>
<td>0</td>
</tr>
<tr>
<td>Latex (u85)</td>
<td>54 kU/l</td>
<td>0</td>
</tr>
</tbody>
</table>

Excerpt from the test evaluation

**Result without Anti-CCD Absorbent:**
Positive reaction to a large number of tested allergens.

**Result with Anti-CCD Absorbent:**
Positive results sometimes show a clear reduction in EAST class (e.g. carrot) or are now negative (e.g. timothy grass). In some cases the test result remains unchanged (e.g. latex).

**Conclusion:**
The patient should avoid the allergens with a positive result.

A differentiated diagnosis is enabled by inhibition of the anti-CCD IgE antibodies. The patient must avoid far fewer allergens than originally diagnosed.
Incubation scheme

**Incubation with the EUROIMMUN Anti-CCD Absorbent**

The Anti-CCD Absorbent lyophilisate must be reconstituted before use. For this, it is dissolved in 110 µl aqua bidest. and then vortexed for approx. 30 seconds and centrifuged at 13,300 rpm (minimum 20 s).

The Anti-CCD Absorbent is then pipetted into the patient sample (for volume information see test instruction). The sample is incubated for 60 minutes at room temperature (RT; +18 °C to +25 °C).

The next incubation is performed according to the instructions of the respective test system.

**At a glance**

- IgE antibodies can be directed against cross-reactive carbohydrate determinants (CCDs) of glycosylated allergens (anti-CCD IgE antibodies). They usually have no clinical relevance.
- Anti-CCD IgE antibodies are strongly cross-reactive due to inter-species structural similarity of the CCDs.
- Anti-CCD IgE antibodies can lead to false-positive results in extract-based in vitro test systems. Actual positive results can only be evaluated after elimination of the anti-CCD IgE antibodies.
- EUROIMMUN's Anti-CCD Absorbent binds the anti-CCD IgE antibodies and thus increases the diagnostic specificity.

**ORDERING**

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
<th>Format</th>
<th>Order no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anti-CCD absorbent</td>
<td>Additional reagent for the incubation of EUROIMMUN allergy profiles</td>
<td>Lyophilisate, 1 x 40 µg</td>
<td>ZD 3001-0101</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lyophilisate, 4 x 40 µg</td>
<td>ZD 3001-0401</td>
</tr>
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</table>