Products for the determination of CCD specific IgE

Specific IgE to cross-reactive Carbohydrate side chains

BACKGROUND

Cross-reactive Carbohydrate Determinants (CCD) are carbohydrate side chains of proteins. There are found in a multitude of allergens, e.g. form grasses, insect venoms, foods and latex. CCD binding immunoglobulin's of subclasses E (IgE) can be detected in patients with Type I allergy. The prevalence and clinical relevance of specific IgE (sIgE) to CCDs has not been completely assessed yet. However, it is known that discrepant results between anamnesis, skin prick test (SPT) and *in-vitro* analysis can be caused by sIgE to CCD.

Figure 1
Possible cross-reactivity of specific IgE mediated by CCD (cross-reactive carbohydrate determinant). Four different groups of allergens are shown as examples.

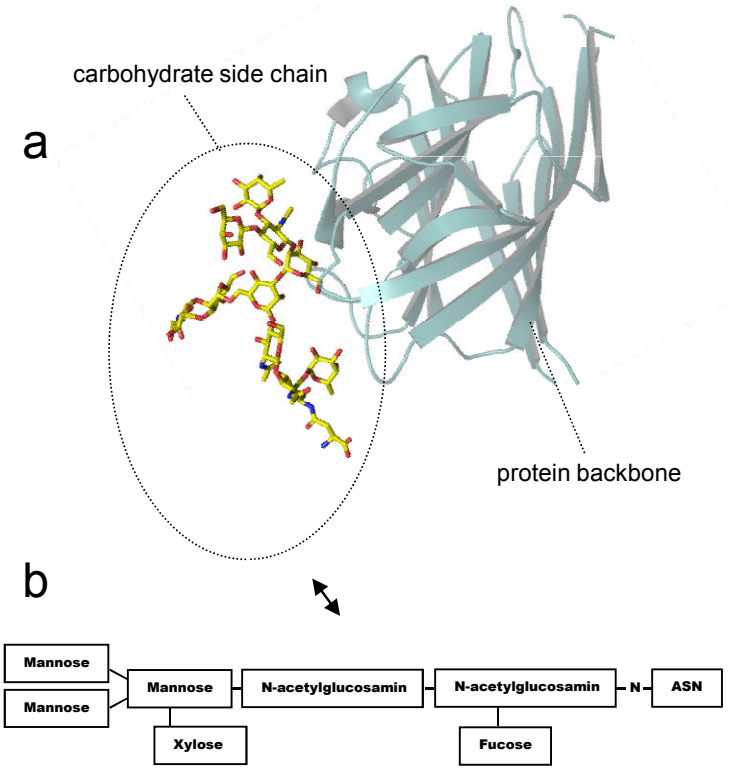

Figure 2
Example of a carbohydrate side chain connected to the protein backbone via ASN (Aspartic Acid) (a.); structure of a Cross-reactive Carbohydrate Determinant (CCD) (b.).

INTENDED USE

The determination of sIgE to CCD is indicated under the following conditions:

- Positive test for sIgE to bee and wasp venom versus negative SPT and/or negative anamnesis.
- Sensitisation against latex found in persons allergic to pollen, but without risk/problems using e.g. latex gloves.
- Sensitisation to plant food (especially vegetables and fruits, but also seeds) without clinical symptoms.
- In patients with multiple positive sIgE test results.

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PROCEDURE

In case of suspected presence of CCD sIgE, the following methods can be performed:

1. Allergy Rapid Assay (ALFA)

A new product for the determination of CCD sIgE is ALFA (Allergy Lateral Flow Assay). Within 20 min the presence of CCD sIgE can be analysed . sIgE against CCDs are detected by using a protein that contains seven carbohydrate side chains. This protein (respectively it`s carbohydrate side chains) is used as a substitute for the respective allergen.

Test Procedure of ALFA

After application of 30 µL serum, plasma or whole blood, 2 drops of allergen solution are added. The presence of IgE against CCDs is indicated by a visible test line.

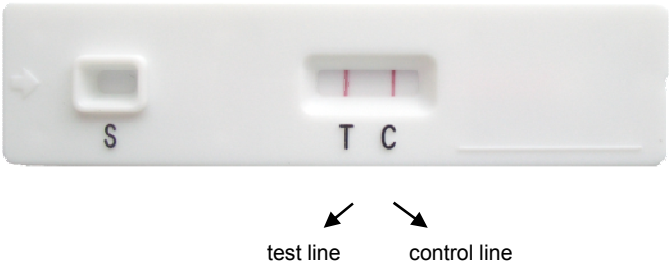

Figure 3
ALFA Basis Set showing a positive test result.

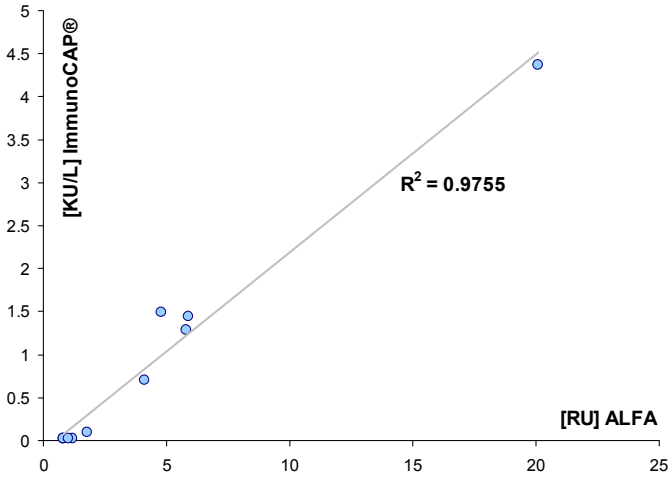

Figure 4
Correlation diagram of ALFA and ImmunoCAP® results for the determination of sIgE to CCDs

2. REAST (ALLERG-O-LIQ)

Detection of CCD sIgE via REAST (ALLERG-O-LIQ System) is also done by the use of a protein that contains seven carbohydrate side chains (as a substitute for the respective allergen). However, in this test system the allergen solution is replaced by CCD buffer. This means the CCD sIgE is detected directly through the commonly used HRP conjugate.

3. EAST

Using EAST the presence of sIgE to CCD can be verified by testing for sIgE to horseradish (F253).

RELATED PRODUCTS

Product	REF
ALFA Basis Set	1800010 / 184000
ALFA Screen CCD	18-ccd 001
Specific IgE EAST with 4 calibrators	0540200PKL / 0541000PKL / 074000PQ
Specific IgE EAST with 6 calibrators	0560200PKL / 0561000PKL / 076000PQ
Allergen disc horseradish	F253
Specific IgE REAST with 6 calibrators	0520960FL / 0524800FL 0529600FL / 07050FL
CCD Buffer	05202FL

LITERATURE

1.Altmann F: **The role of protein glycosylation in allergy.** *Int Arch Allergy Immunol* 2007,**142**:99-115. Review. Hamilton RG, Franklin Adkinson N Jr: **In-vitro assays for the diagnosis of IgE-mediated disorders**. *J Allergy Clin Immunol* 2004; **114**: 213-225.

2. Lucassen R, Fooke M, Kleine-Tebbe J, Mahler M: **Development and Evaluation of a Rapid Assay for the Diagnosis of IgE-mediated Type I Allergies**. *J Investig Allergol Clin Immunol* 2008, **18**:223-230.

3. Lucassen R, Fooke M, Lorenz C, Kleine-Tebbe J, Mahler M: **Evaluation of a rapid assay for the diagnosis of type I allergy**. Abstract: *EAACI* 2008 Barcelona, Spain.

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