

Recombinant allergens for specific immunotherapy

Authors' affiliations:

R. Valenta, S. Vrtala, Vienna, Austria

Specific immunotherapy is the practice of administering allergens to patients with type 1 allergy in order to induce antigen-specific nonresponsiveness (1). While immunotherapy represents the only causative treatment of type 1 allergy, there are several aspects which need attention. Small allergen doses need to be administered over a long period because application of allergens to patients can cause anaphylactic side-effects. Furthermore, diagnosis and treatment are currently performed with allergen extracts which represent difficult-to-standardize mixtures of allergenic and nonallergenic materials. Thus, diagnosis with allergen extracts allows the identification of the allergen-containing source but cannot detect which molecules a patient is sensitized to. Consequently, treatment cannot be performed according to the individual patient's allergen profile.

Recombinant allergens offer several advantages for the diagnosis and therapy of type I allergy. Recombinant allergens can be produced in a controlled way in heterologous host cells (e.g., bacteria, yeast cells, insect cells) with the allergen-encoding DNA as template (2). With recombinant allergens for component-resolved *in vitro* and *in vivo* diagnosis, it is possible to identify the disease-eliciting allergens and thus establish the patient's reactivity profile (3). According to the established reactivity profiles, patient-tailored forms of immunotherapy (component-resolved immunotherapy [CRIT]) appear to be possible. By recombinant DNA technology, recombinant allergen derivatives with greatly reduced allergenic activity can be produced. Recombinant hypoallergenic allergen derivatives can then be used for patient-tailored therapy, and, due to their reduced anaphylactic activity, they hold promise that patients can be treated with fewer injections of high-allergen doses and with a low risk of side-effects.

To cite this article:

Valenta R. & Vrtala S. Recombinant allergens for specific immunotherapy.

Allergy 1999, 54, 43-44.

Copyright © Munksgaard 1999

ISSN 0105-4538

Recombinant hypoallergenic allergen derivatives may thus allow therapy protocols to be developed which are similar to vaccination. Certainly, less complex, allergen (e.g., birch pollen) vaccines have been developed and are close to

clinical evaluation. The molecular, immunologic, and clinical evaluation of recombinant hypoallergenic versions of the major birch-pollen allergen, Bet v 1, supports this concept.

References

1. Bousquet J, Lockey R, Malling H-J and WHO panel members. Allergen immunotherapy: therapeutic vaccines for allergic diseases. WHO position paper. *J Allergy Clin Immunol* 1998;**102**:558–562.
2. Valenta R, Vrtala S, Laffer S, Spitzauer S, Kraft D. Recombinant allergens. *Allergy* 1998;**53**:552–561.
3. Valenta R, Lidholm J, Niederberger V, Hayek B, Kraft D, Grönlund H. The recombinant allergen-based concept of component-resolved diagnostics and immunotherapy (CRD and CRIT). *Clin Exp Allergy* 1999;**29**:896–904.