Pru p3 mutants exhibit low IgE-binding capacity: a good strategy for specific peach immunotherapy

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INTRODUCTION

Treatment of food allergy consists of the avoidance of the specific allergenic food. However, the possibility of cross-reactivity with other food sources makes this practice sometimes ineffective. The use of hypoallergenic molecules with the ability to stimulate T cells may be a promising tool for specific immunotherapy.

MATERIAL AND METHODS

The aim was to produce hypoallergenic Pru p 3, peach LTP, mutants by site-directed mutagenesis, in residues involved in B-epitopes.

Three Pru p3 mutants were produced in Pichia pastoris and purified by chromatographic methods.

The IgE, IgG1 and IgG4-binding capacities of the three of them were tested by direct and inhibition ELISA assays with patients’ sera. Their allergenic capacity was evaluated by skin prick test. The T-cell response induced by these antigens was compared with that of the wild type.

RESULTS AND CONCLUSIONS

IgE binding capacities of Pru p 3.2 and Pru p3.3 were reduced in most tested sera (9-96%), and confirmed by inhibition ELISA assays with a serum pool from peach-allergic patients.

By contrast, IgG1 epitopes were mostly conserved.

Regarding IgG4 epitopes, Mut3 showed decreased binding capacity (58-97%).

The in vivo allergic response was significantly lower for Pru p 3.1 and Pru p 3.2, and negative for Pru p 3.3, confirming the lack of IgE binding by the ELISA assays.

T-cell activation capacities were similar for the natural protein and the mutants. All these data suggest that these molecules could be useful for specific peach immunotherapy.