



Cloning, Expression, Characterization, and Computational Approach for Cross-Reactivity Prediction of Manganese Superoxide Dismutase Allergen from Pistachio Nut

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Background: Tree nut allergy is one of the common potentially life-threatening food allergies in children and adults. Recombinant food allergens offer new perspectives to solve problems of clinical and molecular allergology in diagnosis, research, and therapy of food allergies. So far, superoxide dismutase (s) has been identified as a panallergen and studied in different allergenic sources. Manganese Superoxide Dismutase (MnSOD) has also been reported in pistachio that may cause allergic reactions in atopic subjects. The aim of this study was to describe the cloning, expression, and purification of MnSOD from pistachio nut.

Methods: The pistachio MnSOD was cloned and expressed in *E. coli* BL21 (DE3) using a vector pET-32b (+). A recombinant protein was purified by metal precipitation. The protein immunoreactivity was evaluated using patients' IgE binding by means of ELISA and immunoblotting assays.

Results: The MnSOD gene from pistachio was successfully cloned and expressed in *E. coli*. The purified pistachio MnSOD was recognized by IgE in 10 (40%) out of the 25 sera tested. Our results also showed that this protein might trigger some cross-reactions toward IgE antibodies and thus could be considered as a panallergen.

Conclusions: For the first time recombinant manganese superoxide dismutase from nut source was expressed as a possible allergen. This pistachio allergen could be a possible basis for cross-reactivity with MnSOD from other sources.

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