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PLANT-MADE BET V 1 FOR MOLECULAR DIAGNOSIS

ZAMPIERI R.*[1], SANTONI M.*[1], MERLIN M.*, MARI A.**, CIARDIELLO M.A.***, AVESANI L.*
[1]*these authors equally contributed to this work*

*) Department of Biotechnology, University of Verona, Verona (Italy)
**) Associated Center for Molecular Allergology, Rome (Italy)
***) Insitute of Bioscence and BioResources, CNR, I-80131 Naples (Italy)

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The traditional diagnosis of allergies is based on a skin test system (called also "Prick test"), which has different drawbacks, mainly its difficult standardization. As a consequence, allergy diagnosis is moving towards a molecular approach, which, in turns, currently lacks of a cost-effective diagnostic method tailored on the patient's clinical history and a flexible technique that allows a multiplexed analysis [1].

The Enzyme-Linked Immunosorbent Assay (ELISA), is one of the most popular technique for the detection and quantification of specific biomarker proteins and, as a consequence it is widely used for diagnostic kits set-up.

ELISA, which is based on antigen/antibody interaction, features a high specificity and it can count on an easy enzyme-based detection method, allowing the identification of specific proteins, such as antigens and antibodies, in complex mixture like the blood serum [2].

Given the need of costs saving for the production of a diagnostic system, the antigen production should be cost-effective. Plant Molecular Farming (PMF) may help in this, being a production platform able to produce complex recombinant proteins in short time-frames and at a low-price [3].

PMF was exploited for the production of Bet v 1, a major allergen associated with birch pollen allergy. We describe the production of the protein using two different transient expression systems in *N. benthamiana* plants, one based on a binary vector [4] and one using a vector based on the Potato Virus X genome [5]; their purification from leaf material and their suitability in a new generation allergy diagnosis system, the Friendly Allergen nano-Bead Array (FABER) which allows, the simultaneous analysis of different allergens and their choice based on the patient's clinical history is described.

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