

# Modified proteins as vaccines against peach allergy

January 20 2014



A research conducted by the Centre for Plant Biotechnology and Genomics (UPM-INIA) and led by Araceli Díaz Perales has studied the allergy to peach, the most common food allergy, and the Pru p 3 protein. As a result of this research work, they have developed three hypoallergenic variants of this protein. All can be good candidates for the usage of specific immunotherapy for peach allergy and also can be used as a vaccine.

Nowadays, allergy affects over 25% of the population of developed countries. Currently, the treatment of food allergy consists of avoiding the intake of the food causing the allergy. However, the possibility of cross-reactivity (reaction to related food) might be ineffective.

The specific immunotherapy is the only treatment to prevent more severe signs of allergy progression. Immunotherapy consists of the intake of growing doses of allergen extracts in affected patients. However, the use of this extract could induce anaphylactic reactions or lead to sensitization to new allergens found in the mixture of allergen extracts. According to this, the usage of hypoallergenic molecules (with lower ability of binding antibodies) but with the ability to stimulate the [immune system](#), would be a useful tool for immunotherapy.

The most common [food allergy](#) in Spain and the Mediterranean areas is the peach allergy which is mainly caused by the Pru p 3 proteins. The current treatment of this allergy consists of avoiding peach consumption, neither fresh nor processed peaches (juices jam). As an alternative, this allergy research has defined the regions of this allergenic [protein](#) that is involved in the antibody binding and the stimulation of the immune system cells. After that, researchers developed three hypoallergenic variants of this protein that can be used as a [vaccine](#).

These variants are the result of modifying epitopes (regions of binding antibodies) of this protein and they were used in a research with patient allergic to peach in order to confirm its capacity as immune system stimulation. Each variant has a different modification that was designed by using genetic tools. Although the 1 variant (Pru p 3.01) showed quite similar allergenic activity with the natural protein, the variants Pru p 3.02 and Pru p 3.03 presented lower capacity for binding antibodies. Also, it maintained its ability to stimulate immune system cells (lymphocytes) of the patients allergic to peach during the in vitro trials.

The results show that these two molecules (Pru p 3.02 and Pru p 3.03) could be good candidates for the usage of specific immunotherapy for allergy to peach.

This research work has established the basis to set a new [immunotherapy](#)

strategy although it would be required further trials of these two molecules with animal to verify its effectiveness in the treatment for allergy to peach.

**More information:** "Allergenic Characterization of New Mutant Forms of Pru p 3 as New Immunotherapy Vaccines". *Clinical & Developmental Immunology*, Vol. 2013. [dx.doi.org/10.1155/2013/385615](https://doi.org/10.1155/2013/385615)

Provided by Universidad Politécnica de Madrid

Citation: Modified proteins as vaccines against peach allergy (2014, January 20) retrieved 24 April 2024 from <https://medicalxpress.com/news/2014-01-proteins-vaccines-peach-allergy.html>

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