

Enhanced allergen detection for clinical and agrofood applications

Improved method for producing allergen extracts that strengthens their interaction with the IgE present in the patient serum, thus allowing a more sensitive detection of allergens and consequently a more reliable diagnosis of allergy.

Description and essential characteristics

Food allergy is an emerging major public health problem with severe clinical and quality of life consequences. Its management includes best identification of offending allergens, their strict avoidance and epinephrine treatment for accidental exposures.

The main diagnosis tools to detect a food allergy are tests in the skin of the patient (Skin Prick Tests or SPT). These tests consist of eliciting a reaction in the patient skin by adding a small allergen amount and then assessing the IgE reactivity linked to the patient mast cells. Current standardized allergen extracts used in these tests render a significant number of false negatives due to their weak interaction with the IgE present in the samples/tissues of the hypersensitive patients.

The patented method produces improved food allergen extracts -by folding into an amyloid state- with significantly increased IgE affinity (10^3 -fold increase compared to allergen monomers) thus enabling a more sensitive detection thereof and, accordingly, a more reliable food allergy diagnosis.

This method can be implemented for the extracts of food allergens used as SPT solutions for clinical diagnosis increasing their sensitivity and preventing false negatives.

Targeting both the process for producing amyloid polymers in allergenic foods and their physical clearance provides key tools for hypoallergenic food design.

Competitive advantages

1. This new method enables the stabilization of the immunoallergenic state of the food allergen by forming amyloid polymers thereof, yielding an enhanced IgE affinity and hyper-reactivity (10^3 -fold increase compared to allergen monomer).
2. Favoring the formation and stabilization of amyloid polymers in the solutions used for SPT increases their allergenicity by a 3-fold factor.
3. Use of amyloid-containing SPT solutions will prevent false negatives in diagnosis.
4. Prevention of allergen amyloid formation in food processes generates hypoallergenic foods.
5. Physical clearance of food allergen amyloids reduces the allergen dose of foods.

6. The method can be tailored for any food allergen and used in clinical diagnosis (best signal, less false negatives) and in agrofood industry (avoidance, hypoallergenic foods).

Type of collaboration sought

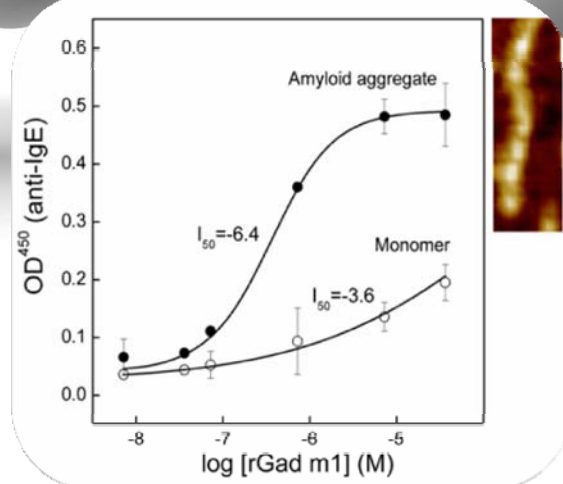
Cooperation is sought with any Party interested in partnering, licensing or investing in the technology, whether it be an investor to fund the project, a partner interested in getting involved in any of the various phases until its placement on the market, a patent licensee, etc. Organisations potentially interested in this technology are those within the pharmaceutical (allergy diagnosis and prevention, etc.) and agrofood industries (design of hypoallergenic food, etc.).

Current stage of development

In vitro studies were carried out on sera samples from 10 fish-allergic patients (mean age: 9.8 years, 7 boys) from La Paz University Hospital with specific IgE antibodies to cod parvalbumin.

Current state of intellectual property

European patent application 16382413.9, filed in September 2016.



Titration curves of recombinant Gad m1 and of its mutants stabilized in the monomer and amyloid states with sera IgE

For further information, please contact

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