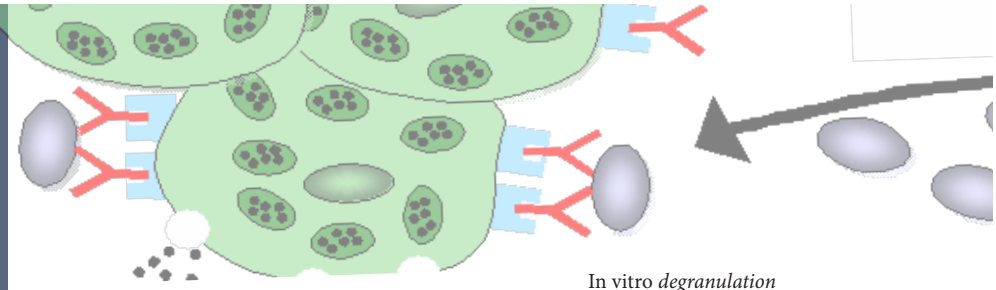


In vitro *degranulation*

A chimeric antibody for allergenicity assessment of functionalized glutens

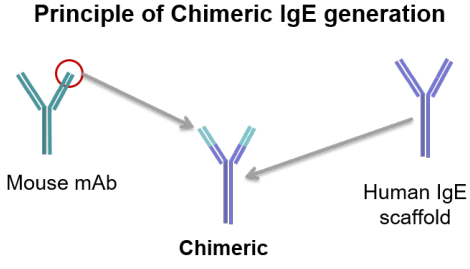
Since the 1990s, glutens have been functionalized by acid hydrolysis for use as ingredients in foods or cosmetics. However, these modified glutens turned out to be neo-allergenic, as the deamidated proteins induce the production of specific IgE-type antibodies that trigger an allergic reaction, and the first reports of allergies were described in Europe and Japan just a few years after commercial release of products containing deamidated gluten. We have produced a chimeric antibody specific to these deamidated glutens that can serve as a tool to characterize their allergenic potential.

▸ RESULTS

Analysis of 4 industrial samples of functionalized glutens implicated in allergy cases in Europe and Japan revealed that all 4 showed the same modified deamidation, but with different deamidation levels. An *in vitro* cell model mimicking the reaction triggered by exposure to sera from allergic patients showed that these deamidated glutens had variable allergenic potency. Using a mouse antibody (INRA-DG1) raised against the neo-epitopes recognized by the patients' antibodies, we found that the allergenicity of the deamidated products was mainly borne by epitopes with the most highly deamidated sequences. A recombinant chimeric (mouse/human) IgE-type antibody was produced by inserting the INRA-DG1 antibody binding site into a human IgE. This chimeric IgE, like the murine antibody, is able to detect the deamidated glutens, and it also has a similar biological activity to that of the patient IgE—the chimeric IgE-DG1, like the patients' IgE, induces a symptomatic reaction *in vitro*—and can thus serve to assess the allergenicity of functionalized glutens.

▸ FUTURE OUTLOOK

This research builds on patent WO2013/054063 protecting the INRA-DG1 antibody and its chimeric version. The chimeric IgE could ultimately be used as a lab-based substitute for patient sera to assess the allergenicity of deamidated glutens.



Chimeric IgE

Participants

- Center for Immunology and Inflammatory Diseases, Massachusetts General Hospital and Harvard Medical School, Boston, USA
- National Institute of Health Sciences, Science food institute, Tokyo, Japan

Read more

Allergy to Deamidated Gluten in Patients Tolerant to Wheat: Specific Epitopes Linked to Deamidation

(2012) Allergy

Denery-Papini S *et al.*

A chimeric IgE that mimics IgE from patients allergic to acid-hydrolyzed wheat proteins is a novel tool for in vitro allergenicity assessment of functionalized glutens

(2017) Plos One

Tranquet O *et al.*

Mobilization and impact

The INRA-DG1 antibody and its chimeric version are currently protected under patent EP2961769 A1.

This chimeric IgE could ultimately be used as a lab-based substitute for patient sera for allergenicity assessments of functionalized glutens.

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