

IgY for Prophylaxis of Celiac Disease Symptoms

Ref. No.: CH586

Background

Celiac disease is an autoimmune / allergy disorder characterized by gluten intolerance, and is associated with a number of serious clinical conditions. Even though the prevalence of celiac disease is about 1%, there is still no special therapy; therefore people with celiac disease have to follow a strict gluten-free diet. A number of pathogenic peptide fragments of gluten, the so-called gliadins have been identified so far. The endogenous tissue transglutaminase (tTG) modifies gliadin by transforming the amino acid glutamine in glutamate. In celiac disease patients these tTG-modified gliadins (deaminated gliadin) represent the very pathogenic form of gliadin which interact with increased produced HLA proteins and induce complex reactions within the small intestine mucosa and the immune system. As a result autoantibodies against gliadins / modified gliadins as well as antibodies against the human endogenous tTG are produced by the patients.

Technology

We offer novel polyclonal poultry IgY antibodies (e.g. enriched in egg yolk) which are able to bind a) the pathogenic form of gliadin (deaminated gliadin) and b) tTG. Thereby two mode of actions can be triggered:

i) IgY's prevent binding of pathogenic gliadin to HLA proteins, thereby T-cell over-activation will be decreased and ii) IgY's inactivate tTG enzyme activity and thereby prevent the generation of further pathogenic gliadin by tTG. The IgY were produced against a) an artificial 31 amino acid peptide (CDP) which is able to bind pathogenic celiac disease patient's antibodies and b) a fusion protein consisting of a tTG2 peptide and the CDP peptide. It is supposed that the CDP peptide resembles the pathogenic gliadin in its conformational structure. The IgY antibodies can be produced in high quantities in the egg yolk of chicken through specific immunization. By using the IgY-enriched egg yolk, celiac disease symptomatic can be inhibited and prevented.

Benefits

- ✓ Poultry IgY are known to be not antigenic in mammal, do not bind to cellular Fc-receptor and do not activate the complement system
- ✓ Polyclonal IgY recognize several epitopes -> very effective inhibition of the binding of tTG-modified gliadin to HLA epitopes
- ✓ At the same time inhibition of tTG enzyme activity
- ✓ Polyclonal poultry antibodies expressed in yolk – no purification necessary
- ✓ Inhibition of all tested patient antibodies against CDP and tTG

Application

IgY for the prophylaxis of celiac disease symptoms

Commercial Opportunity

Searching for a licensing or strategic partner

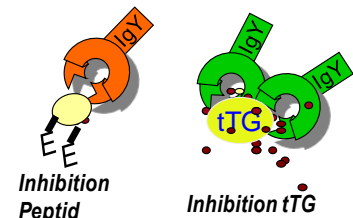


Fig. 1: IgY's bind and thereby inactivate pathogenic gliadin (tTG modified gliadin) and human tissue transglutaminase
Kindly provided by Dr. K. Skriner

Key words

IgY, celiac disease, gliadin, tissue transglutaminase, tTG, pathogenic gliadin, poultry

Developmental Status

In vitro

IP Status

DE priority application (10/2009)
PCT application (10/2010)
EP patent granted (01/2017)
JP patent application pending

Publication [here](#)

Patent Owner

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