

Technology Offer

IgY for Prophylaxis of Celiac Disease Symptoms

Ref. No.: CH586

Background

Celiac disease is a worldwide 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 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.

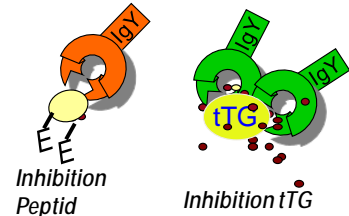


Fig. 1: IgY's bind and thereby inactivate pathogenic gliadin (tTG modified gliadin) and human tissue transglutaminase
Kindly provided by Dr. Skriner

Technology

We offer novel polyclonal poultry IgY antibodies (e.g. enriched in egg yolk) arising against a) an artificial 31 amino acid peptide (CDP) which is able to bind pathogenic celiac disease patient's antibodies which are directed against modified gliadin and b) a peptide of the tTG2 as well as c) a fusion protein consisting of tTG2 peptide and CDP peptide for the prophylaxis of celiac disease symptoms. The IgY antibodies are able to bind the pathogenic form of gliadin which is supposed to resemble the CDP peptide in its conformational structure. Furthermore, the IgY mix binds tTG2 and thereby prevents the generation of pathogenic gliadin by tTG.

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 as a functional food / nutritional supplement, celiac disease symptoms can be inhibited and prevented.

Benefits

- ✓ Poultry IgY are known to be not antigenic in mammals, 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-based functional food for the prophylaxis of celiac disease symptoms

Commercial Opportunity

Searching for a strategic partner or financial investor

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)
US-, EP-, JP patent application (10/2010)

publication [here](#)

Patent Owner

Charité- Universitätsmedizin Berlin

Contact

Dr. Bettina Büttner
Technology Manager

Tel.: +49 30 450 570 874
Fax: +49 30 450 7570 964

Bettina.Buettner@charite.de
<http://technologietransfer.charite.de>