CYREX® Laboratories

CLINICAL SPECIFICATIONS

WHEAT GERM AGGLUTININ (saliva)

Function:

The biological function of Wheat Germ Agglutinin (WGA) in wheat is unknown, however, its suggested function is to protect against fungal infection due to its ability to bind to chitin-containing cell walls. WGA is a lectin protein that binds to N-acetylglucosamine (GlcNAc) and is a binder of gram-positive bacteria via GlcNAc moies in the peptidoglycan layer of the cell wall.[1, 5, 6]

Associated With:

Loss of oral tolerance

Known Cross-Reactions: Lysozyme aka muramidase or N-acetylmurmamide glycanhydrolase[8]

Clinical Significance:

The presence of salivary antibodies to Wheat Germ Agglutinin (WGA) is an indication of a diet rich in agglutinins and loss of mucosal tolerance, the onset of food immune reactivity and the activation of complement via the lectin-binding pathway. The offending food and its known cross-reactive foods should be eliminated from the diet. Patients with gluten-sensitive enteropathy (Celiac disease)[7] and/or Insulin-Dependent Diabetes Mellitus[3] typically have high levels of serum IgG antibodies against WGA. Serum IgA antibodies against WGA are found in patients with gluten-sensitive enteropathy (Celiac disease),[7] as well as other autoimmune disorders.[2] Genetically susceptible people, prone to diabetes, have higher incidence of spontaneous Type 1 Diabetes when exposed to wheat antigens in association with a pro-inflammatory gastrointestinal environment.[4]

Suggested Reading:

1. de Punder and Pruimboom. The dietary intake of wheat and other cereal grains and their role in inflammation. Nutrients, 2013; 5(3):771-787.
2. Dalla Pellegrina, et al. Effects of wheat germ agglutinin on human gastrointestinal epithelium: insights from an experimental model of immune/epithelial cell interaction. Toxicol Applied Pharmacol, 2009; 237:146-153.
3. Kitano, et al. Detection of antibodies against wheat germ agglutinin bound glycoproteins on the islet-cell membrane. Diabetic Med, 2009; 5(2):139-144.
4. Mojibian, et al. Diabetes-specific HLA-DR-restricted proinflammatory T-cell response to wheat polypeptides in tissue transglutaminase antibody negative patients with type 1 diabetes. Diabetes, 2009; 58:1789-1796.
5. Pusztai, et al. Antinutritive effects of wheat-germ agglutinin and other N-acetylglucosamine-specific lectins. Brit Nutri, 1993; 70:313-321.
6. Rüdiger and Gabius. Plant lectins: occurrence, biochemistry, functions and applications. Glycoconjugate, 2001; 18(8):589-613.
7. Sollid, et al. Antibodies to wheat germ agglutinin in coeliac disease. Clin Exp Immunol, 1986; 63:95-100.
8. Tchernychev and Wilchek. Natural human antibodies to dietary lectins. FEBS Lett, 1996; 397:139-142.

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