CYREX® Laboratories

CLINICAL SPECIFICATIONS

TRANSGLUTAMINASE-3

Function:

Transglutaminases are a family of enzymes. They form protein polymers, like scaffolding, which are vital in the formation of barriers and stabilizing structures. Tissue Transglutaminase-3 (tTG3) is expressed mainly in the epidermis, and to a lesser extent in the placenta and the brain.[1] In the epidermis tTG3 plays a role in the formation of cell envelope barrier structures and in the hair follicle tTG3 helps in the hardening of the inner root sheath.[1,4] Commercial food industry uses transglutaminase to bind proteins together in the making of processed meats, including fish and imitation meats.[7]

Antibodies Appear:

Celiac disease[5]
Dermatitis herpetiformis[1,5]
Esophageal cancer[6]
Gluten sensitivity[5]
Huntington's disease[3]

Known Cross-Reactions: Transglutaminase-2[3,5] and -6[2]

Clinical Significance:

Tissue Transglutaminase-3 (tTG3) has been shown to be up-regulated in a variety of degenerative diseases.[1,3] More commonly, gluten-sensitive enteropathy (GSE) manifests as a small bowel disorder (Celiac disease), however, in certain patients, GSE results in a disorder of the skin called dermatitis herpetiformis (DH).[5] DH is characterized by granular IgA deposits in the papillary dermis, which contribute to polymorphic papules and blisters often located over extensor surfaces of the major joints.[5] Patients with Huntington's disease have been shown to make elevated antibody levels to Transglutaminase-1, -2 and -3.[3] Transglutaminase is activated by oxidative stress, during which inflammatory cytokine production increases, specifically tumor necrosis factor-alpha and interferon-gamma.[1,3,5] Huntington patients have been shown to produce more interferon-gamma and interleukin-2 than healthy controls.[3] Elevated tTG3 expression is in esophageal cancer.[6]

References:

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6. Uemura, et al. Transglutaminase 3 as a prognostic biomarker in esophageal cancer revealed by proteomics. Int J Cancer, 2009; 124:2106-2115.
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