

## CLINICAL SPECIFICATIONS

# TRANSGLUTAMINASE-2

### Function:

Transglutaminases are a family of enzymes. They form protein polymers, like scaffolding, which are vital in the formation of barriers and stable structures. The Transglutaminase found in the gastrointestinal tract is responsible for the conversion of glutamine to glutamic acid.<sup>5</sup> Commercial food industry uses transglutaminase to bind proteins together in the making of processed meats, including fish and imitation meats.<sup>6</sup>

### Antibodies Appear:

Celiac disease<sup>1</sup>  
 Crohn's disease<sup>1</sup>  
 Dermatitis herpetiformis<sup>3</sup>  
 Ulcerative colitis<sup>1</sup>

**Known Cross-Reactions:** Fibrinogen,<sup>7</sup> Transglutaminase-3 and -6<sup>2</sup>

### Clinical Significance:

**Salivary Antibodies** – The earliest indication of a breakdown of the body's first line of defense is found in oral fluid.<sup>5</sup> Salivary IgA against tissue Transglutaminase-2 (tTG2) can represent enzyme deficiency or an early event in non-celiac gluten-sensitivity or Celiac disease.

**Serum Antibodies** – Detection of serum antibodies to tTG2 may indicate gastric autoimmunity. Coupled with gliadin antibodies, tTG2 antibody results can assist with differentiating Celiac disease (CD) and non-celiac gluten-sensitivity (NCGS). If both are IgA positive, the patient may have CD, which must be confirmed by biopsy. If Gliadin is positive and tTG2 negative, the patient could be suffering from NCGS. If tTG is positive and gliadin is negative the patient may have autoimmunity. Transglutaminase in the gut cross-links with antigens during intestinal permeability and then carries them to mast cells. In genetically susceptible individuals who carry either the HLA-DQ 2, or 8, gene responsible for Celiac disease, tTG2 cross-links with gliadin peptides, and therefore antibodies are produced against a combination of both gliadin and tTG.<sup>4</sup> Researchers postulate that the deamidation of gliadin peptides is mediated by endogenous tTG2 in a macro-environment suited to initiate an immune response.<sup>4</sup> Gastric inflammation creates an environment that induces tTG2 activity.<sup>4</sup> Since humans have transglutaminase in many other tissues, including bone, antibodies produced against epithelial cell tTG2 can cross-react with other tTGs including brain. In such cases, this cross-reaction leads to autoimmune responses against brain tissue and thus develops into neuroautoimmunity. Generally, patients with elevated antibodies to tTG2 are susceptible to autoimmunity.

### References:

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