Celiac disease (CD) is a chronic gastrointestinal disorder most likely caused by an abnormal immune reaction to wheat gliadin and related gluten components from barley, rye, and possibly oats. Originally thought to be predominantly diagnosed in populations of European origin, newer studies indicate that other regions of the world have similar diagnostic rates. Worldwide, CD exerts a prevalence of approximately 1%, although the numbers can vary between different countries.

The disease is characterized by flattening of the jejunal mucosa and intestinal lesions of variable severity in genetically predisposed individuals. CD does not fit the typical characteristics of an autoimmune disease; yet it is associated with the occurrence of autoantibodies. Dietary gluten induces the production of autoantibodies against gliadin and the target autoantigen, tissue transglutaminase (tTG). The diagnosis of CD involves the serological analysis for the presence of anti-tTG and anti-gliadin autoantibodies with the analysis of the former showing both a higher sensitivity and specificity. Furthermore, the levels of these autoantibodies appear to highly correlate with the activity and severity of the disease, and are therefore especially useful for the patient’s dietary and therapeutic monitoring.

Traditionally, tTG isolated from guinea pig tissue has been used as the antigen in the development of diagnostic tests for CD. Since guinea pig and human tTG are only 80% identical, efforts were increased to produce recombinant human tTG.

DIARECT’s recombinant human tTG antigens have been specifically modified for improved handling: substitution of an amino acid within the enzymatic active site eliminates tTG’s intrinsic protein cross-linking activity while maintaining its native three-dimensional structure and secondary GTPase activity. This engineering assures reproducible properties of the recombinant antigen preparations by eliminating variable and ill-defined covalent aggregates between human tTG and host-cell proteins.

Two recombinant human tissue transglutaminase forms expressed in baculovirus/insect cells and E. coli, respectively, are available from DIARECT.

Recombinant gliadin from DIARECT is produced in E. coli.

References:
Dietrich et al. (1997) Nat Med. 3:797-801
Schuppan et al. (2013) Dtsch Arztebl Int. 110:835-846

In some countries the use of certain antigens in diagnostic tests may be protected by patents. DIARECT is not responsible for the determination of these issues and suggests clarification prior to use.