

CLINICAL SPECIFICATIONS

MICROBIAL TRANSGLUTAMINASE

Antigens Made From:

Pure microbial transglutaminase

Associated With:

Microbial transglutaminase immune reactivity
 Celiac disease¹

Known Cross-Reactions: Gliadin-Transglutaminase Complex¹

Clinical Significance:

Microbial transglutaminase (mTg), also known as thrombin, is a product added to a powder used in the food manufacturing industry to adhere smaller pieces of food to make decorative for or give food a pleasing texture.^{2,3} It is used to combine small pieces of meat into one large fillet, or to turn flakes of white fish into imitation crab meat, or form chicken scraps into nuggets. It is also used to thicken some milks, yogurts and egg whites. Experiments using mTg in wheat bread indicate a prevention of the deamidation of gliadin, thus making the bread less immunogenic to patients with Celiac disease.^{4,5} Microbial transglutaminase is used in gluten-free pasta in order to make non-gluten grain flour sticky. Microbial transglutaminase is not required to be included in an ingredients list. Microbial transglutaminase may also be used in some medications to make them more water soluble, non-aggregating, non-immunogenic and more stable against digestion.⁶ The combination of mTg with other foods can significantly alter the native food protein,⁷ making the food more antigenic to a person who may not react to the native food protein.

References:

1. Matthias et al. The industrial food additive, microbial transglutaminase, mimics tissue transglutaminase and is immunogenic in celiac disease patients. *Autoimmun Rev*, 2016; 15(12):1111-1119.
2. Kieliszek and Misiewicz. Microbial transglutaminase and its application in the food industry. A review. *Folia Microbiol*, 2014; 59:241-250.
3. Foghani et al. Effects of microbial transglutaminase on physicochemical properties, electrophoretic patterns and sensory attributes of veggie burger. *J Food Sci Technol*, 2017; 54(8):2203-2213.
4. Zhou et al. Abrogation of immunogenic properties of gliadin peptides through transamidation by microbial transglutaminase is acyl-acceptor dependent. *J Agric Food Chem*, 2017; 65:7542-7552.
5. Moscaritolo et al. Effects of two-step transamidation of wheat semolina on the technological properties of gluten. *Foods*, 2016; 5:49. doi:10.3390/foods5030049
6. Fontana et al. Site-specific modification and PEGylation of pharmaceutical proteins mediated by transglutaminase. *Adv Drug Deliv Rev*, 2008; 60(1):13-28.
7. Yokoyama et al. Properties and applications of microbial transglutaminase. *Appl Microbiol Biotechnol*, 2004; 64(4):447-454.