



WORLD CONGRESS OF GASTROENTEROLOGY AND DIGESTIVE DISEASES



Torsten Matthias, Patricia Wusterhausen

Aesku.Group GmbH, Wendelsheim, Germany

Microbial Transglutaminase: A New Potential Player in Gluten Related Disorders

Abstract: Celiac disease (CD) incidence is increasing worldwide, alongside, the food industry is introducing ingredients such as microbial transglutaminase (mTG) that revolutionize food production. Human tissue transglutaminase (tTG) is the autoantigen of celiac disease. Both enzymes de/transamidate gluten, known to induce Gluten Related Disorders (GRD) like Celiac Disease (CD) or Non-Celiac Gluten Sensitivity (NCGS).

The hypothesis suggests that mTG acts as an environmental enhancer of GRD based on several key scientific findings. Similar to endogenous tTG, mTG modifies gluten through deamidation and transamidation. However, mTG is less selective with its substrates and can crosslink a wide range of proteins and other macromolecules. This alteration affects their structure, antigenicity, and physical and chemical properties, thereby increasing the load that the immune system must handle. Additionally, mTG enhances the stability of proteins, including gluten, against proteinases, which reduces nutrient digestion efficiency and impedes the elimination of foreign proteins. In CD, intestinal permeability increases, with gluten and infections as key contributors. Industrial mTG modifies gluten and cross-links it with other food components, disrupting tight junctions between intestinal cells. This allows more immunogenic molecules to enter, potentially triggering GRD. Industrial use of microbial transglutaminase (mTG) may initiate gluten-related disorder (GRD) pathogenesis as early as food processing, market storage, or within the gut, due to early deamidation and cross-linking. Consuming foods treated with mTG could elevate GRD incidence by creating immunogenic neo-epitopes. Transparent labeling of mTG use is crucial until further research clarifies its risks. If these effects are confirmed, they could reshape additive policies, product labeling, consumer awareness, regulatory standards, and public health practices.

Keywords: Gluten Related Disorders, Celiac Disease, Non-Celiac Gluten Sensitivity, microbial Transglutaminase, Neo-epitopes

Biography: Patricia Wusterhausen completed her Master's degree in Biomedical Sciences and Technology at the University of Applied Sciences in Mannheim in 2012. Shortly after graduation, she joined the AESKU.KIPP Institute, where she served as a Project Manager for over a decade, contributing to advancements in biomedical research and technology. In 2024, Patricia transitioned to the role of Medical Science Liaison Manager at AESKU.Diagnostics in the Research & Development department, where she now supports scientific communication and fosters collaboration to drive innovation in diagnostic solutions. Her career reflects a deep commitment to the field of biomedical sciences and cutting-edge diagnostics.