

Solid formulation for targeted intestinal delivery of peptidases to supplement brush border enzymatic activity

Enteropathies such as celiac disease are caused by the impaired ability of the organism to fully digest potential immunogenic peptides stemming e.g., from gluten.

In this project peptidase combinations isolated from different fungal species are first characterized with respect to their hydrolytic activity of peptide sequences known for their immunogenicity. These are normally digested by brush-border-bound peptidases. Promising enzyme candidates are then formulated into MUPS (multi-unit particulate systems). The beads (pellets) are manufactured in a fluidized bed – rotor equipment and coated in fluidized bed with wurster accessory. The performance of the dosage form in the upper small intestine (duodenum) is evaluated in a biorelevant dynamic gastrointestinal in vitro model in the presence of food. The goal is to achieve delivery of enzymes to the target site of digestion by peroral administration for rapid, safe and complete hydrolysis of gluten peptides. The overall objective of the project is to obtain critical insights into formulation, kinetics of hydrolysis and digestive efficiency of the delivery system and achieve next-generation enzyme supplementation as preventive and curative medication against celiac disease.

The project is carried out at the Institute of pharma technology and biotechnology of the School of Life Sciences – FHNW by PhD candidate Laura Biedermann in the group of Prof. Georgios Imanidis in collaboration with AMYRA Biotech AG.

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