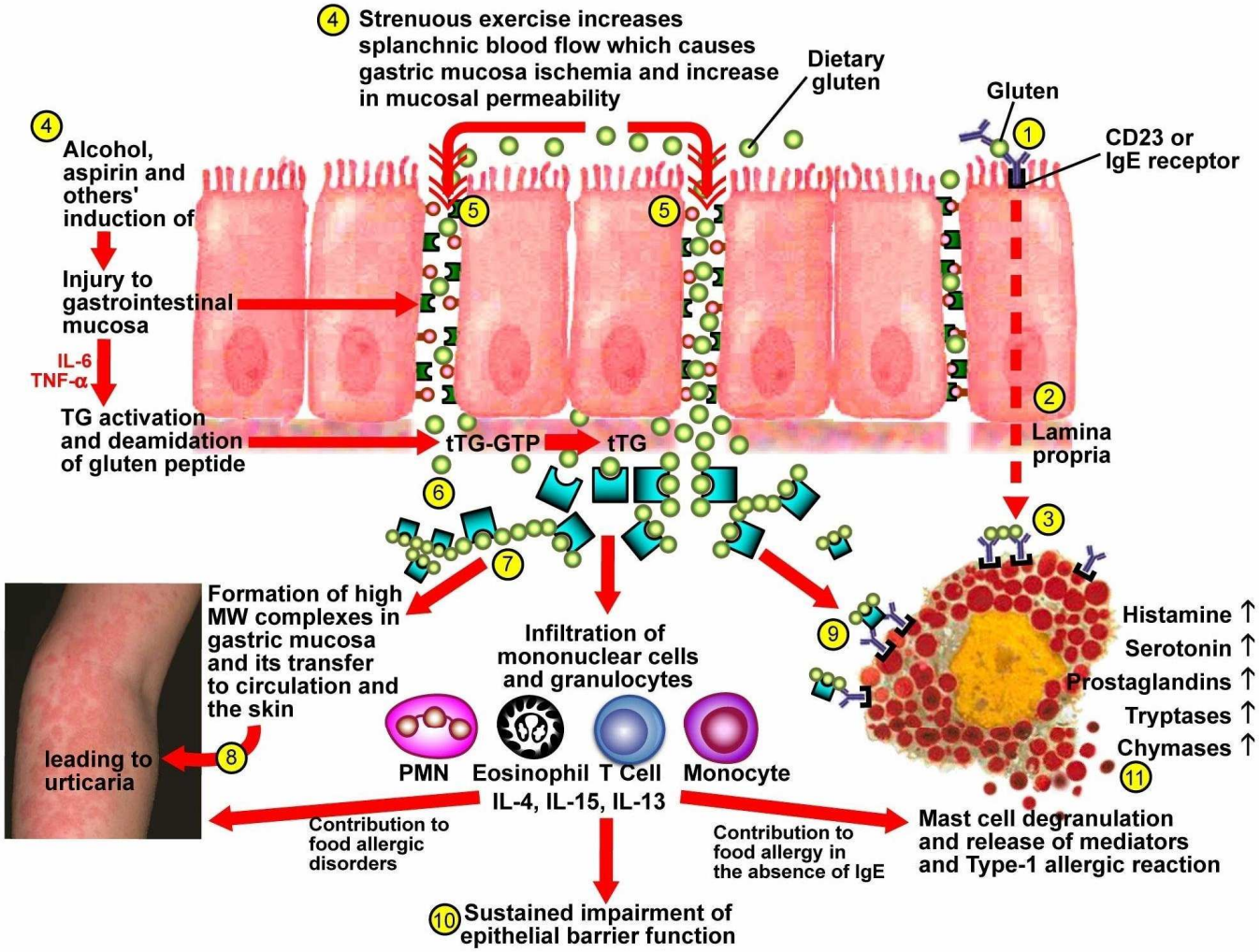

Schematic presentation of the pathophysiology of the immediate hypersensitivity reactions (Type 1 allergy) of the intestine.

This hypersensitivity reaction may occur by the binding of dietary peptides (gluten) to low affinity IgE receptor CD23, which is expressed on the epithelium of the small intestine (1), facilitating uptake of antigen in an IgE-independent manner (2).

Gluten cross-links to IgE on the surface of MAST cells to induce degranulation (3). This MAST cell degranulation could be induced by strenuous exercise, alcohol and medication [aspirin] (4), causing injury to gastrointestinal mucosa and an increase in mucosal permeability (5).

Under these conditions, parts of gluten that are resistant to processing by luminal and brush-border enzymes will survive digestion and be transported across the mucosal epithelium as polypeptides.

Upon activation of transglutaminase in the subepithelial region (6), many gliadin peptides form high molecular weight complexes with transglutaminase (7) which can be transferred into the circulation and the skin, leading to urticaria (8).

These complexes can also bind to IgE receptors on MAST cells and induce further degranulation (9). Finally, infiltration of granulocytes, mononuclear cells and their cytokines can contribute to late phase responses, which results in the impairment of epithelial barrier function (10).

Also, products released from MAST cells, including histamine, serotonin, prostaglandins, tryptases and chymases (11) have been shown to have direct and indirect effects (via activation of the enteric nerve) on epithelial ion secretion, barrier function, and intestinal motility.