

4th International Conference and Exhibition on **Probiotics, Functional and Baby Foods** November 03-05, 2015 Valencia, Spain

Influence of probiotic administration on the expression of TLR2, TLR4, transcription factors NF-kB and XBP1 structures of gait of rats in the conditions of the chronic social stress

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Aim: To investigate the influence of chronic social stress and modulation of intestinal micro-flora with probiotics on the distribution of TLR2+/4+/-, NF-kB+/-, XBP1+-lymphocytes in the gut-associated lymphoid tissue.

Methods: Researches have been conducted on 70 rats (female) of Wistar line, which were divided in 5 experimental groups: Control rats (group-1); rats, which were modeled CSS1 by means of three weeks social isolation and prolong psycho-emotional influence (group-2); rats, which having CSS2 modeling by means of keeping animals in over populated cages with every day change of grouping (group-3); rats with CSS1 and CSS2 which were made the modeling of intestinal micro-flora by means of everyday administrations of *lactobacterine* (groups-4 and 5 accordingly). Structure of population of TLR2+/-, TLR4+/-, Nf-kB+/- and XBP1+-cells has been studied by the analysis of serial histological sections using the method of direct and indirect immunofluorescence with monoclonal antibodies to TLR2, TLR4, Nf-kB and XBP1. We investigated lymphoid follicles (LF) and sub-epithelial zone (SZ) Peyer's patches (PP) and lymphocyte-filled villi (LFV), which are separate and distinct compartment in GALT line Wistar rats.

Results: It has been established that the CSS development leads to a significant activation of the innate immune system and accompanied by an increase expression of TLR2, TLR4, transcription factors Nf-kB which leads to raising the level of pro-inflammatory signaling in the gut. In addition, it has been shown that on the background of chronic social stress develops endoplasmic reticulum stress, which is accompanied by a unidirectional trend to reduce the total number of XBP1+cells and the concentration change XBP1 immune cells depends on the type of stress. Modulation of the composition of intestinal micro-flora by probiotics at CSS accompanied by an increase of total number of TLR4+/-, Xbp1+ lymphocytes, reduces the total number of TLR2+/-, Nf-kB+/-cells in GALT and depends on the kind of stress.

Conclusions: The discovered alterations of TLR2/4, NF-kB, Xbp1 expression under stress may be one of the triggers for development of autoimmune and IBD. And, given the fact that in some cases the receiving of LB can increase the pro-inflammatory signaling, increased understanding of the molecular actions and transcriptional networks regulated by NF-kB and XBP1 in immune cells may aid in the development of potential therapeutics targeting immune disorders.

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