

Abstract

Adipocytokines released by the adipose tissue play an important role in the regulation of immune and inflammatory responses. In case of obesity their production is badly regulated, which is one of the major factors contributing to the onset of a chronic low-grade overall inflammatory response. This response represents a risk factor for the progression of other diseases, such as atherosclerosis or type-2 diabetes. The main goal of this thesis consisted in comparing the secretion of selected adipocytokines (adiponectin, IL6 and MCP1), isolated from the adipose tissue prior to and after a dietary intervention, and this under basal conditions and during stimulated lipolysis. Based on the same profile, the secretion of the isoforms of adiponectin was compared subsequently. The concentration of adiponectin, IL6 and MCP1 was determined by the ELISA method, the Western Blot method was used to determine the distribution of the adiponectin isoforms.

The thesis also concentrates on the gene expression of ATF3, ATF4 and HSPA5, factors engaged in the ER stress in the course of the differentiation of adipocytes. The changes in the gene expression were measured by the quantitative Real Time PCR method. To prove the correct process of the differentiation the genes *aP2* and *PPAR γ* were used. Within the framework of this analysis the profile of the differentiation of adipocytes was created with the help of indirect immunofluorescence. Changes in the secretion of cytokines (adiponectin, IL6 and MCP1) resulting from the weight reduction obtained by the dietary intervention itself were not proven. β -adrenergic stimulation caused a reduction in the secretion of adiponectin and a significant increase in IL6. Adding cAMP directly caused even a manifold increase in the secretion of ILF, but a decrease in case of MCP1. Studying the distribution of the isoforms of adiponectin proved a predominant secretion of HMW, significance was only apparent after the stimulation of cAMP after the dietary intervention.

The advancing differentiation of adipocytes brought about an increase in the expression of the genes engaged in the paths activated predominantly by the ER stress (ATF3, ATF4 and HSPA5). These results are the proof of the fact that the differentiation of adipocytes itself can act as a factor of the ER stress.