

ABSTRACT

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Title of thesis: Study of expression of glutathione peroxidases in mice with induced obesity

Obesity is serious worldwide health issue. The most common reason for developing obesity is unbalanced intake and energy expenditure. It is connected to a higher amount of reactive oxygen species (ROS) in organism, which increases the risk of developing health issues related to obesity. Between these issues are belonging mainly cardiovascular diseases, metabolic syndrome or type two diabetes mellitus.

The goals of many studies focusing on obesity are identification of new biomarkers, searching for target structures for obesity treatment and potentially developing antiobesity drugs.

Glutathione peroxidases (GPxs) are enzymes with antioxidation activity. Currently, there are eight GPxs described. They can reduce the amount of reactive oxygen species (ROS) produced in our body. The GPxs can cause damage to the surrounding tissues in case of their accumulation and they are related to many diseases. Based on these findings, efforts have been made to discover how the expression of GPxs genes is regulated and how they are connected to microRNA (miRNA).

MiRNA are small, non-coding, single-stranded RNA molecules. They usually consist of about 22 nucleotides and they are involved in the negative posttranscriptional regulation of gene expression. Their deregulation is, among other things, connected to some diseases.

This work was elaborated to find out how the expression of GPxs genes in obese-induced mice is affected, how they differ in lean mice and what is the relationship of obesity, GPx and certain miRNAs. Their expression was quantified in adipose and liver tissue. To be specific measurements were provided in visceral adipose tissue (white adipose tissue, brown adipose tissue) and in subcutaneous adipose tissue.