

DESCRIPTION FOR THE GENERAL PUBLIC (IN ENGLISH)

Type 2 diabetes mellitus (T2DM) and non-alcoholic fatty liver disease (NAFLD) are one of the most common diseases within the societies of a developed countries. It is thought, that they may occur hundreds of millions of people all around the world. Both T2DM and NAFLD are related with: obesity, inappropriate diet and a lack of physical activity of the patients suffering from them. One of the mechanisms of T2DM and NAFLD is insulin resistance, which means a decreased sensitivity to insulin of tissues responsible for the controlling of blood glucose level. Insulin resistance leads to the loose of the control over glucose level in blood what results in hyperglycemia. One of the main reasons of this pathology is an inhibition of the insulin signaling pathway what leads to a lowered expression of glucose transporters, and thus decreased glucose uptake. Previous studies have showed that a major cause of the development of insulin resistance in hepatocytes or skeletal muscles is obesity and impaired lipid metabolism. That is why, finding new drugs that may counteract liver steatosis and ameliorate lipid metabolism seems to be the main target in treatment of so called civilizational diseases like obesity, T2DM or NAFLD. Multiple studies show that both obesity and T2DM are associated with an increased concentration of non-esterified fatty acids in plasma what leads to an increased influx of fatty acids to the cells inappropriate for that purpose like hepatocytes or skeletal muscles. The phenomenon of insulin resistance is observed, among others, in a diet-related liver steatosis caused by diet reach in a saturated fatty acids, mainly palmitate.

The aim of a present study is to find a new, effective and multifunctional anti-diabetic drugs, within plant-derived polyphenols. The substances that would have effect both on insulin resistance, lipid metabolism and liver steatosis. If our hypothesis will be confirmed the results of a present research may lead to the development of a novel oral anti-diabetic medicaments.