The evidence beginning from 1980$^{th}$ suggests that high fructose diet causes the development of IR features: tolerance to glucose, dyslipidemia, abdominal obesity and other disorders such as non-alcoholic fatty liver disease, hypertension, kidney injury, et al. The possible mechanisms of high-fructose diet consequences are not limited only by high calorie intake but are explained by difference of its metabolism from glucose. Thus, fructose is metabolized independently from insulin, so utilized by other from glucose GLUT transporters. Furthermore phosphofructokinase, the rate-limiting enzyme, is not involved into metabolism of fructose. Instead, fructose enters the pathway at a level that is not regulated and is metabolized to fructose-1-phosphate primarily by fructokinase, which has no feedback system. Also, fructose consumption triggers hepatic lipid synthesis and, at the same time, inhibits fatty acid oxidation resulting in hypertriglyceridemia, visceral adiposity and increased body weight. Fructose is a potent reducing monosaccharide that promotes the formation of advanced glycation end-products.

**Conclusions.** Chronic fructose feeding of rats, mostly reported from 5 to 8 weeks or more, induce glucose tolerance and increase in body weight associated with hyperinsulinemia and loss of normal sensitivity to insulin.

## SYNTHETIC CHALCONES REDUCE BLOOD GLUCOSE LEVEL IN RATS UNDER EXPERIMENTAL INSULIN RESISTANCE

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**Introduction.** Diabetes Mellitus (DM) is the fastest growing metabolic disorder. The search for newer anti-diabetic agents is extremely important and relevant now. Chalcones, secondary metabolites of terrestrial plants and precursors of the flavonoids biosynthesis, have been used for a long time in the traditional medicine due to their wide-range of biological activities, from which the anti-diabetic activity stands out.

**Aim.** The aim of our study was to investigate hypo glycemic activity of newly synthesized chalcones in rats under experimental insulin resistance.

**Materials and methods.** Our investigations were conducted on inbred albino male rats (14 weeks age) weighing 180-200 g. Insulin resistance was induced by keeping animals on a high fructose diet: every day they received a 20% fructose solution instead of water for 7 weeks. Insulin resistance development was controlled by measuring of blood glucose and insulin levels in experimental animals. At the end of the experiment oral glucose tolerance test was conducted. Rats were loaded by glucose solution in dose 3 g/kg body weight per os. Chalcones solution was administrated intragastrically in dose 10 mg/kg body weight. Metformin was used as a comparison drug. Blood glucose level was determined with the help of glucometer “One Touch Select” (LifeScan, USA) at the 0, 2, 4, 6 and 8 hours after extracts administration, samples were collected by gingival vein punction. The data were processed statistically.

**Results and discussion.** Keeping animals on a high-fructose diet was accompanied by the development of 6.52±0.67 mmol/l compare to 3.96±0.23 mmol/l in healthy animals. It was found that glucose load in control healthy animals induced hyperglycemia development with the maximum 6.84±0.59 mmol/l after 60 min. After 120 min glucose level was decreased to normal range. In fructose-fed rats glucose load also induced severe hyperglycemia up to 10.03±1.34 mmol/l after 60 min. In this experimental group glucose level decreased by 45% but not to normal range. Chalcones administration led to glucose level decrease after 60 min (8.27±0.63 mmol/l) and after 120 min was significantly lower that in control pathology group.

**Conclusions.** The results shown that the newly synthetic chalcones exhibit hypoglycemic activity. The results obtained indicate the need for further preclinical studies in order to create a new antidiabetic drug.