

Hepatic Lipid Metabolism is Modified by Resveratrol

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Resveratrol is a well known antioxidant that has been recently proposed as a molecule able to modify lipid metabolism in different tissues and organs.

The aim of the present work was to analyze the effect of various doses of resveratrol on the triacylglycerol content and the activity of hepatic enzymes involved in fatty acid oxidation and lipogenesis in the liver of rats fed a high-fat diet.

Thirty two male Sprague-Dawley rats were divided into four experimental groups fed a high-fat diet during 6 weeks: a control group (C) and three groups receiving resveratrol at doses 6 (RSV1), 30 (RSV2) or 60 (RSV3) mg/kg body weight/d, respectively. Hepatic lipids were obtained by using the Folch method and triacylglycerols (TG) were quantified. Liver carnitine palmitoyltransferase-1 (CPT-1) and acyl-CoA oxidase (ACO) were assessed in mitochondrial/peroxisomal fraction, and glucose-6-phosphate dehydrogenase (G6PDH), malic enzyme (ME) and fatty acid synthase (FAS) were assessed in cytosolic fraction. The results were analyzed by ANOVA I and post-hoc Newman Keuls test, and significance was assessed at the $P < 0.05$ level.

	C	RSV1	RSV2	RSV3
TG (mg/g)	13.5 ± 1.4	15.8 ± 1.2	11.6 ± 0.7	12.1 ± 0.5
Enzyme activities (nmol/min/mg protein)				
CPT-1	3.48 ± 0.26 ^b	5.84 ± 0.82 ^a	5.93 ± 0.91 ^a	5.99 ± 0.89 ^a
ACO	3.34 ± 0.18 ^b	4.10 ± 0.54 ^b	5.52 ± 0.50 ^a	5.85 ± 0.51 ^a
G6PDH	14.6 ± 2.2	11.8 ± 1.4	13.0 ± 1.5	11.1 ± 1.9
ME	12.3 ± 1.3	9.4 ± 0.7	15.3 ± 1.5	12.4 ± 1.3
FAS	16.8 ± 1.8	14.9 ± 1.4	14.8 ± 1.5	14.6 ± 1.2

^{a,b} Values in the same row with different superscript letters were significantly different.

These results demonstrate that the liver is a target for resveratrol. This molecule activates fatty acid oxidation but it does not act on de novo lipogenesis. No clear dose-response effect was observed. Despite of this change, the amount of triacylglycerols was not significantly reduced.

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