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Food & Function

Voluntary exercise and green tea enhance the expression of genes related to energy utilization and attenuate metabolic syndrome in high fat fed mice

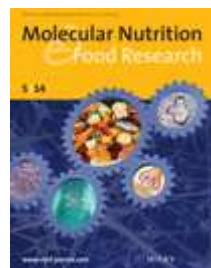
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Obesity and metabolic syndrome are growing public health problems. We investigated the effects of decaffeinated green tea extract (GTE) and voluntary running exercise (Ex) alone or in combination against obesity and metabolic syndrome in high fat (HF) fed C57BL/6J mice. After 16 wk, GTE + Ex treatment reduced final body mass (27.1% decrease) and total visceral fat mass (36.6% decrease) compared to HF-fed mice. GTE + Ex reduced fasting blood glucose (17% decrease), plasma insulin (65% decrease), and insulin resistance (65% decrease) compared to HF-fed mice. GTE or Ex alone had less significant effects. In the skeletal muscle, the combination of Ex and GTE increased the expression of peroxisome proliferator-activated receptor- γ coactivator-1 α (*Ppargc1a*), mitochondrial NADH dehydrogenase 5 (*mt-Nd5*), mitochondrial cytochrome b (*mt-Cytb*), and mitochondrial cytochrome c oxidase III (*mt-Co3*). An increase in hepatic expression of peroxisome proliferator-activated receptor- α (*Ppara*) and liver carnitine palmitoyl transferase-1 α (*Cpt1a*) and a decrease in hepatic expression of stearoyl-CoA desaturase 1 (*Scd1*) mRNA was observed in GTE + Ex mice. GTE + Ex was more effective than either treatment alone in reducing diet-induced obesity. These effects are due in part to modulation of genes related to energy metabolism and de novo lipogenesis.

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