

Effects of Green Tea on Activation of AMPK in a Diabetic Mouse Model

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Tea, a beverage made from leaves of the plant *Camellia sinesis*, has shown beneficial health effects in animal and human models. One of the proposed mechanisms of action of green tea is activating AMP-activated protein kinase (AMPK) in the liver, skeletal muscle, and adipose tissue. The activated AMPK would decrease gluconeogenesis and fatty acid synthesis and increase catabolism, leading to body weight reduction and metabolic syndrome alleviation. In this project, we tested this hypothesis using green tea at different doses. Female db/db mice were divided into 5 groups (10 in each group) and fed an AIN93M diet enriched with 1% or 2% green tea extract (GTE) or green tea powder. After collecting the liver sample and extracting the protein, AMPK levels were determined by Western blots. The primary antibodies used included those against: AMPK, p-AMPK, and β -actin. Protein bands were detected using the Odyssey CLx imaging system and quantified by densitometry. The activation of AMPK was measured by the ratio p-AMPK/AMPK. Results showed that mice received a diet enriched with 1 % of GTE did have higher p-AMPK/AMPK ratios than the control group (2.179 ± 1.851 vs. 1.000 ± 0.451 , $P > 0.05$) but the results were not statistically significant, suggesting that experimental variation was wide. These findings suggested AMPK was not readily activated by a long term treatment of GTE in db/db mice and further study is needed to identify the mechanism of green tea on AMPK. Supported by NIH R25ES020721 and P30ES005022.