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Modulation of adipogenesis and lipolysis by green tea in 3T3-L1 adipocytes

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Green tea have been widely reported as functional foods because of their various bioactivities. In the present study, we used 3T3-L1 cells model of white adipocytes to clarify whether green tea and its main pharmaceutically effective compounds (EGCG, caffeine and theanine) prevent obesity. Cellular viability, glycerol-3-phosphate dehydrogenase activity, glycerol release and HSL mRNA levels were checked. Glycerol release into the medium was significantly increased by the cells treated with green tea extract. Glycerol release into the medium was significantly increased by the cells treated with green tea extract. Caffeine and theanine from green tea showed some level of lipolytic activity, and glycerol-3-phosphate dehydrogenase activity was remarkably decreased by EGCG. These results suggest that green tea has anti-obesity effect through inhibition of adipogenesis and stimulation of lipolysis. Catechins and theanine of green tea might be the factors responsible for the modulation of lipid metabolism and adipocyte differentiation.