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## Antiobesity Effects of Crocetin, a *Crocus sativus* L compound

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Adipocyte differentiation (adipogenesis) is an important process for good cellular function. However, an inadequate adipocyte differentiation leads to hypertrophy and hyperplasia of adipose tissue, and finally the development of obesity. Currently, there is a growing interest in the study of therapeutic approaches to counteract obesity based on the use of natural products because these offer advantages over chemical treatments. The anti-obesity effects of these compounds include, among other, a decrease in the differentiation or proliferation of preadipocytes, an increase in lipolysis or a decrease in lipogenesis. Usually, antiobesity plants exhibit high antioxidant activity. Saffron (*Crocus sativus* L.) contains several bioactive compounds. One of them, crocetin, is known to have powerful antioxidant properties. Our proposal is to check whether crocetin is able to exert the above-mentioned antiobesity effects. To achieve this, the process of adipogenesis will be carried out on cellular cultures of 3T3L1 preadipocytes in presence or absence of crocetin. In both situations, we will study: a) biometrics and counting of lipid droplets at different stages of preadipocyte differentiation, b) the accumulation of intracellular fat within the droplets and, c) lipolytic activity. Several concentrations of crocetin (in the  $\mu\text{M}$  range) will be tested. Possible cytotoxicity will be ruled out at the end of differentiation process by applying a cell viability assay based on an MTT colorimetric test. Adipocyte morphology will be studied by means of phase-contrast photomicrography (WinLipid Software) at 3 different stages of preadipocyte differentiation (early, intermediate and late). Lipid accumulation will be visualized using oil red dye and quantified by spectroscopy, lipolytic activity will be determined by means of a glycerol-free measurement and quantified by spectroscopy. Both determinations will be carried at a late differentiation stage. The expected results are that crocetin would: 1) reduce the size or number of lipid droplets, 2) decrease lipid accumulation within the adipocytes and/or, 3) increase lipolytic activity.