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Saffron: A potential target for a novel anti-cancer drug against hepatocellular carcinoma

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Saffron has been proposed as a promising candidate for cancer chemoprevention. The purpose of this investigation was to investigate the chemopreventive action and the possible mechanisms of saffron against diethylnitrosamine (DEN)-induced liver cancer in rats. Administration of saffron (75 mg/kg per day) started two weeks prior to the DEN injection and was continued for 22 weeks. Saffron significantly reduced the DEN-induced increase in the number and the incidence of hepatic nodules. Saffron also decreased the number and the area of placental glutathione-S-transferase positive foci in livers of DEN-treated rats. Furthermore, saffron counteracted DEN-induced oxidative stress in rats as assessed by restoration of superoxide dismutase, catalase, and glutathione-S-transferase levels and diminishing of myeloperoxidase activity, malondialdehyde and protein carbonyl formation in liver. Immunehistochemistry showed that saffron inhibited the DEN mediated elevations in numbers of cells positive for Ki-67, cyclooxygenase 2, inducible nitric oxide synthase, nuclear factor-kappa Bp-65 and the phosphorylated tumor necrosis factor receptor. Saffron also blocked the depletion in the number of cells positive for TUNEL and M30 CytoDeath in liver tissues of DEN-treated rats. In vitro experiments carried out using HepG2 cells confirmed those findings and showed inhibition of NFkB activation, increased cleavage of caspase-3, and DNA damage and cell cycle arrest upon saffron treatment. The present study provides evidence that saffron exerts a significant chemopreventive effect against liver cancer through inhibition of cell proliferation and induction of apoptosis. This report also shows some evidence that saffron protects rat liver from cancer via modulating oxidative damage and suppressing inflammatory response.

Biography

Prof. Amin is a graduate faculty at UAE University who supervised many graduate theses. He earned his PhD from University of Illinois at Chicago and received a postdoctoral training at University of Pennsylvania School of Medicine. After joining UAEU Prof. Amin's focus was redirected to the field of preventive medicine. His lab is interested in natural product's protection against diabetes and cancer. He has published many articles, reviews and book chapters in reputable journals. He serves on the editorial boards and as a reviewer of many international journals. Prof. Amin is also the recipient of many national and international awards.