

# Preclinical Renal Cancer Chemo Preventive Efficacy of Hesperidin by Abrogation of Oxidative Stress and Targeting COX-2/PGE2 Pathway

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**Abstract**—Renal cancer is a global health problem and its treatment in modern system of medicine is very limited. Hesperidin, a flavonoid found in citrus fruits is known for its wide range of biological and pharmacological properties and has found to be effective in the treatment of many diseases. The present study was designed to evaluate the protective effects of hesperidin on DEN initiated and Fe-NTA promoted renal carcinogenesis in wistar rats. Renal cancer was initiated by a single i.p injection of DEN (200 mg/kg b.wt) and promoted with Fe-NTA (9 mg Fe/kg b.wt i.p) twice a week for 16 weeks. Rats were simultaneously administered with hesperidin (100 and 200 mg/kg b.wt) for 16 consecutive weeks. The chemopreventive effects of hesperidin was assessed in terms of antioxidant activities, renal function, PGE2 level and the expressions of COX-2 and VEGF. Hesperidin decreased the DEN and Fe-NTA induced lipid peroxidation, improved the renal function (BUN, creatinine) and restored the renal antioxidant armory (GSH, GPx, GR, SOD, catalase). Further, hesperidin was found to decrease the level of PGE2 and downregulate the expressions of COX-2 and VEGF that were unregulated by DEN and Fe-NTA administration. Histological findings further revealed the protective effects of hesperidin against DEN and Fe-NTA induced kidney damage. The result of our present findings suggest that hesperidin may be a promising modulator in preventing renal cancer possibly by virtue of its ability to alleviate oxidative stress and inhibit COX-2/PGE2 pathway.

**Keywords:** Hesperidin, Renal cancer, Oxidative stress, Chemoprevention.