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## Amelioration of Curcumin of Nicotine Induced Necrosis of Different Tissues of Female Rats in Protein Restricted Condition

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Uses of different forms of nicotine (smoking and smokeless tobacco products) have been a major public health issue for many years. It is related with several cancers, cardiovascular disorder and many other diseases. Low dietary protein possesses a constraint on the metabolic activity and results in impaired detoxification machinery. The adverse effects of nicotine on different organs under protein restricted condition are still unclear. This study was performed to investigate the ameliorative effect of curcumin against nicotine induced changes in different tissues under protein restricted condition. Albino-rats were maintained under normal/protein-restricted diets and subcutaneously injected with nicotine tartrate (2.5 mg/kg body weight/day) and orally supplemented with curcumin (80 mg/kg body weight/day) for 21 days. The effects of the drugs were monitored by comet assay, UV-visible and CD-spectroscopy, and molecular docking. Cytokine profile and gene expression studies were performed by ELISA and Real-time-PCR respectively. Nicotine binds to DNA and distorts its structure at low concentrations and induces strand breaks at high concentration (>1mM). Curcumin revives nicotine induced structural changes of DNA. Nicotine elevates IL-6, TNF- $\alpha$  and STAT3 expression more in protein restricted condition and enhances p65 and Bcl-2 expression more in normal condition. Over-expression of antiapoptotic protein and DNA structural alteration by nicotine in normal diet condition indicates higher chances of malignant transformation of cells, whereas extensive DNA damage and inflammatory responses in protein restricted diet indicates cell-necrosis. Curcumin effectively ameliorates nicotine induced changes in both dietary conditions.