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### Role of dietary additives in suppressing the PhIP induced cytotoxicity

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The 2-amino-1-methyl-6-phenylimidazo[4-5-b]pyridine (PhIP) is mutagenic and carcinogenic heterocyclic amine formed during the cooking of meat. Several studies have shown that PhIP can induce tumors in breast, prostate and colon cells and in rodent models. Metabolism of PhIP results in the formation of free radicals (ROS) and PhIP metabolites are known to produce DNA adduct and DNA strand breaks. The metabolism and mutational effects of PhIP are well defined. Phytochemicals are known to inhibit cytotoxic and genotoxic effects. Therefore, we hypothesized that the right combination of antioxidants and or phytochemical (naturally present in fruits, vegetables and spices) along with grilled meat should be capable of suppressing the PhIP induced cytotoxicity and breast cancer. Therefore, a model system using human breast epithelial cells (MCF 10A) was developed to test various antioxidants in presence or absence of PhIP. We have tested four vitamin (C, K3, D3, and E), Gingerol (6 and 10), N-acetyl cysteine, glutathione and curcumin at varying concentrations. The protective effect of these compounds was evaluated using cell viability assay, DCF assay to quantify ROS production, Comet assay to quantify the DNA damage and DNA adduct formation by immunofluorescence method. Results indicate that presence of these compounds improves cell viability as compared to PhIP treated group. However, curcumin co-treated cells showed significant differences and PhIP induced cell cytotoxicity was consistently reverted to normal. Gene expression analysis indicates that curcumin interact via multiple molecular targets, suggesting that curcumin appears to be an effective anti-PhIP food additive.

#### Biography

A Jain has completed his PhD from Agra University, India. He was a visiting scientist at Texas A&M University. Currently he is a Professor at Albany State University, GA and program coordinator for Biotechnology program. He has received research funding from NIH, DOD and USDA. He served as Director, Center for Undergraduate Research and currently he is serving as MARC U\*STAR project director. He has published more than 25 papers in reputed journals and has been serving as reviewer for six journals of international repute.

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