



## Service Priorities and Programmes

### Electronic Presentations

**Convention ID:** 709

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**Possible protective roles of carcinogen detoxification enzymes in the development of cancers in the GI & respiratory tracts**

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**Keywords:**

detoxification enzymes

GST

CYP-450

nasopharyngeal cancer

colorectal cancer

lung cancer

**Introduction**

Human bodies are daily exposed to different kinds of carcinogens through ingestion of foods and inhalation of polluted air. The intestinal & respiratory tracts are covered by a layer of mucosal epithelium which protects the body from carcinogenic insults. This protection is carried out by a xenobiotic detoxification enzyme/protein system (including enzymes such as CYP-P450, FMO, ALDH, NQO & GST) which help to convert carcinogens into water soluble products which can be easily excreted from the mucosa.

**Objectives**

We aim to examine the expression of various carcinogen detoxification enzymes in the normal tissues, benign tumor tissues and malignant carcinoma tissues in different parts of the GI and respiratory tracts to examine the possible protective roles of these detoxification enzymes in cancer development.

**Methodology**

Immunohistochemical staining and RT-PCR techniques were performed in tissue microarray slides to determine the protein expression of these carcinogen detoxification enzymes in the mucosal epithelium in various parts of the GI and respiratory tracts. Enzyme expression in different histological types of cancers and benign tumors at different stages of tumor development in the GI and respiratory tracts was also determined. Results were correlated with cancer incidence, with

tobacco smoking status and their stages of carcinogenesis.

### **Result**

We have found a strong inverse correlation of the expression of a number of carcinogen detoxification enzymes with cancer incidence with regions of rare cancer development having the strongest expression of detoxification enzyme and the regions of frequent cancer development having the lowest enzyme expression. The enzyme expression also appears to be substantially lower in the lung cancer patients with tobacco smoking history than those without smoking. The expression of these detoxification enzymes also correlated with the stages of cancer development with highest expression found in the normal epithelium tissues, medium expression in the benign tumor tissues and lowest expression in the malignant cancer tissues. This finding indicates a strong role of the carcinogen detoxification enzymes in cancer prevention. We are examining the cancer preventive roles of existing chemopreventive drugs and dietary supplements which can induce the activity and expression of these detoxification enzymes.