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Cinnamaldehyde (a widely used food flavor): A double edged sword

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Abstract

Cinnamaldehyde (CNMA) occurs naturally in the leaves and twigs of various species of the genus *Cinnamomum*. It is used in foods, beverages, medical products, perfumes, cosmetics, soaps, detergents, creams, and lotions. CNMA is often used as a stomachic, an antipyretic and an antiallergic drug and as a tonic in traditional Chinese medicines. *Cinnamomum zeylanicum* exhibited strong inhibitory effects on osteoclastogenesis. About 180,000 kg of CNMA is consumed each year in foods, 39,000 kg from the use of cinnamon and 141,000 kg deliberately added as a flavor. Thus, CNMA has a high potential for human consumption in the world. CNMA is chemically related to some toxicologically more active compounds like styrene and coumarin, acrolein and crotonaldehyde. Thus, concern about the safety of CNMA was raised. Because of the potential carcinogenic risk to the general population, CNMA was selected by NTP, FEMA and WHO for study. The WHO, which established a temporary ADI for CNMA in 1984, was unable to extend this level because of inadequacies in the toxicity data and later, the committee suggested that the metabolic and pharmacokinetic data of CNMA should be revived. Our previous studies reveal CNMA induced oxidative stress leads to toxicity at the WHO suggested dose level. In the present study, we will evaluate gene expression changes associated with CNMA induced toxicity by using microarray technology. Studies on the expression of genes will be helpful on the therapeutic point of view.

Biography

Sivakumar Gowder, an Associate Professor at the College of Applied Medical Sciences, Qassim University, KSA, got his academic training and carried out his research in institutions of high academic ranking in India and US. He earned his PhD from the University of Madras-India and continued his research at AIIMS-India, UT Southwestern Medical Center-US, LSU Medical Center-US, and University of Pittsburgh School of Medicine-US. Sivakumar received several prizes/awards during his academic career. He developed his own scientific methods/ techniques (confocal/fluorescein method for cellular transport, enzymatic assays, etc), published several peer reviewed articles and edited books (Cell Interaction, Toxicity and Drug Testing, etc). Currently, Sivakumar serves as a principal investigator for projects (including KACST-National Grant); an author / editor for books; editorial member for many prestigious journals, an editor in chief for an international journal, and a fellow and advisory board member for various international organizations.