Kazim Sahin, J Nutr Food Sci 2013, 3:4
http://dx.doi.org/10.4172/2155-9600.S1.008

OMICS Group Conferences
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2nd International Conference and Exhibition on
Nutritional Science & Therapy

July 15-17, 2013 Courtyard by Marriott Philadelphia Downtown, USA

Molecular targets of dietary phytochemicals for alleviation of stress

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Stress leads to oxidative stress associated with a reduced antioxidant status in humans and animals as reflected by increased oxidative damage and lowered plasma concentrations of antioxidants. In terms of reducing the negative effects of stress, antioxidants are used in the animal diets because of the reported benefits of these supplements including their anti-stress effects and also due to the fact that their utilization and thus normal concentrations are reduced during stress. In this review, we present evidence that numerous agents can interfere with several cell signaling pathways in animal models. The agents include epigallocatechin-3-gallate (EGCG; green tea), lycopene (tomato) and resveratrol (red grapes, peanuts and berries). For instance, the cell-signaling pathways inhibited by EGCG alone include transcription factors [nuclear factor kappa-light-chain-enhancer of activated B cells (NF-κB) and nuclear factor (erythroid-derived 2)-like 2 (Nrf2) and activator protein-1 (AP-1) that regulate cyclooxygenase-2 (COX-2). We will also address some of the mechanisms proposed for the stress preventive activity of EGCG, lycopene and resveratrol focusing on the induction of antioxidant enzymes (phase II enzymes) through the activation of the antioxidant response element (ARE) transcription system.

Biography

Kazim Sahin, male, nutritionist, graduated from School of Veterinary Medicine, Ankara University in 1990. He is working for Firat University. His research focuses mainly on vitamin and mineral metabolism, cancer prevention, stress and obesity. He organized the First International Congress on Nutrition and Cancer in Antalya, Turkey in May 2008 and Fifth International Congress on Nutrition and Cancer in Elazig, Turkey in September 2012. He was also the first to report that dietary lycopene intake prevents leiomyoma and renal cancer in the Eker rats and Japanese quail in collaboration with medical researchers at Emory University, Atlanta and Wayne State University, Detroit, USA. He has approximately 128 original papers in peer-reviewed international journals (Web of Science) and review articles. He is a Principal Member of The Turkish Academy of Sciences and Diplomate of ECPVS.

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