whereas CB2 knockouts developed enhanced inflammation and tissue injury. Thus, the endocannabinoid system, through CB2 receptors, protects against cisplatin-induced kidney damage by attenuating inflammation and oxidative/nitrative stress, and selective CB2 agonists may represent a promising novel approach to prevent this devastating complication of chemotherapy.

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Cannabidiol Protects against Chronic Plus Binge Alcohol Induced Liver Injury by Modulating Neutrophil Infiltration, E Selectin, Inflammation and Oxidative/Nitrative Stress

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Cannabidiol is a non-psychoactive component of *Cannabis Sativa* (marijuana). In this study we investigated the effects of cannabidiol on liver injury induced by chronic plus binge alcohol feeding using mouse model (NIAAA-model). Cannabidiol significantly attenuated chronic plus binge alcohol feeding induced liver injury (measured by liver transaminases AST/ALT and histopathology) and liver triglyceride accumulation (oil-O-Red staining and triglyceride content). Cannabidiol also attenuated neutrophil accumulation (MPO staining), inflammation (TNFα, MCP1, IL1β, MIP2 and E-Selectin), oxidative stress (MDA, HNE and NT), and reactive oxygen species generating enzymes (xanthine oxidase and NOX2) expressions. Cannabidiol also modulated chronic plus binge alcohol feeding induced hepatic metabolism (G6Pase, UCP1, MCD, PPARα mRNA expressions). under in vitro condition, cannabidiol attenuated PMA induced respiratory burst of neutrophils isolated from chronic plus binge alcohol fed mice. Collectively, our results strongly suggest that cannabidiol may have therapeutic potential in the treatment of liver injury and inflammation.

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Protection against UVA-Induced Melanogenesis by Dietary Phenolics through Nrf2-Mediated Antioxidant Defenses

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UVA-mediated oxidative stress plays a vital role in melanogenesis through induction of tyrosinase and therefore antioxidant roles of dietary phenolics in inhibition of skin pigmentation have been widely investigated. Nrf2, a transcription factor, binds to ARE in the promoter regions of its target genes responsible for transcription of antioxidant genes. This study thus investigated the inhibitory effects of phenolics (caffeic acid, ferulic acid and gallic acid) commonly present in plant-based diets on UVA-induced melanogenesis through modulation of Nrf2-mediated antioxidant defenses in mouse melanoma (B16F10) cells. All test phenolics (up to 30 μM) were shown to provide anti-melanogenic effect on B16F10 cells irradiated with UVA (8 J/cm^2) by inhibition of melanin synthesis, tyrosinase activity, protein and mRNA. Test phenolics were also able to abrogate UVA-induced ROS formation as well as reduction of GSH, glutathione-s-transferase activity, their related gene expression and Nrf2-ARE activity. The antioxidant mechanisms of the phenolics in suppressing UVA-induced melanogenesis possibly involved enhanced transcriptional activity of Nrf2/ARE signaling-mediated antioxidant defenses.

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Vitamin E Isomer γ-Tocotrienol Alleviates Experimental House Dust Mite Asthma

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Background: Inflammation and oxidative stress are involved in asthma pathogenesis. Vitamin E consists of 8 isomers, namely (α-, β-, γ-, δ-) tocopherols and tocotrienols. We hypothesized that γ-tocotrienol has anti-inflammatory and anti-oxidative effects on asthma. This study explored efficacies of γ-tocotrienol against Prednisolone, in a house dust mite (HDM, *Dermatophagoides pteronyssinus*) murine asthma model.
Methods: BALB/c mice were sensitized and challenged with HDM. Bronchoalveolar lavage (BAL) fluid was assessed for total and differential cell counts, oxidative damage biomarkers, and cytokine levels. Lung tissues were examined for cell infiltration and mucus hypersecretion, and the expression of antioxidants and pro-inflammatory biomarkers. Sera were assayed for IgE and pharmacokinetics of γ-tocotrienol. Lung function was determined via invasive measurements of airway hyperresponsiveness (AHR) to bronchoconstrictor methacholine.
Results: In preliminary screens, γ-Tocotrienol was selected for its superior free radical neutralizing activity *in vitro* and inhibition of BAL fluid total and differential cell counts in HDM mouse asthma, as compared to other vitamin E isomers. Oral γ-tocotrienol dose-dependently reduced HDM-induced elevation of BAL fluid total, eosinophil and neutrophil cell counts; IL-4, IL-5, IL-17, G-CSF and RANTES levels, total reactive oxygen species, and 3-Nitrotyrosine, 8-isoprostane and 8-hydroxy-2-deoxyguanosine levels. γ-Tocotrienol abrogated lung tissue mRNA levels of IL-13, IL-33, periostin, MUC5AC and NADPH oxidases, and promoted lung antioxidant activities of superoxide dismutase, catalase and glutathione peroxidase. γ-Tocotrienol suppressed methacholine-induced AHR in HDM-challenged mice. γ-Tocotrienol inhibited activation of NF-κB but upregulated nuclear Nrf2 levels in lung tissues from HDM mouse asthma.
Conclusions: We have shown for the first time the protective actions of vitamin E isomer γ-tocotrienol in the treatment of allergic asthma by sequestering free radicals, abating oxidative damage, and restoring antioxidants activities coupled with anti-inflammatory actions in the inflamed airways.

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