OMICS International
conferenceseries.com

Transl Med 2015, 5:4
http://dx.doi.org/10.4172/2161-1025.C1.017

4th International Conference on

Translational Medicine

October 26-28, 2015 Baltimore, USA

Cinnamon's traditional applications to its novel effects on the inhibition of angiogenesis in cancer cells and prevention of Alzheimer's disease, and a series of functions such as anti-oxidant, anti-cholesterol, anti-diabetes, anti-bacterial

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Cinnamon has been used traditionally in food preparations and as an herbal medicine to treat a variety of symptoms and their ailments. Cinnamon is known to have antioxidant, antibacterial, anti-inflammatory and other therapeutic properties. New studies reaffirm the importance of cinnamon as a spice but also suggest that it may be a natural remedy to treat serious diseases such as type 2 diabetes, chronic digestion problems, cardiovascular diseases, and even cancer and Alzheimer's. However, further investigations and clinical studies need to occur to prove the effectiveness of Cinnamon in treating diseases and to clarify the quantity, quality, duration and types of applications.

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Advanced human *in-vitro* models for the study of drug induced cholestasis

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Cholestasis is among the most common adverse effect leading to drug induced liver injury. Drugs usually disrupt bile acid homeostasis by interfering with their metabolism and transport. Although animals especially rodents have been extensively used in cholestasis research, the clinical translation of this knowledge has been very disappointing. Major reasons are species-specific differences in bile acid composition, metabolism and transport. The purpose of this study was to evaluate the suitability of human HepaRG cells comprising of hepatocytes and cholangiocytes as in-vitro model for screening for cholestatic liver injury. We studied the effects of bosentan which impairs the canalicular excretion of bile acids from the hepatocytes. We also investigated the effects of hydrocortisone as inducer of bile acid metabolism and inhibitor of OATP. Bile acids were analysed by LC-MS. Supplementation of serum concentrations of major bile acids resulted in intracellular accumulation of chenodeoxycholic acid upon Bosentan exposure and glycocheno deoxycholic acid upon hydrocortisone exposure in HepaRG cells. We also investigated the effects of bosentan in 2D and 3D HepaRG cultures for 14 days. Using metabolomics we investigated metabolic and cellular alterations. Repeated dose bosentan exposure resulted in more than 20 fold decrease in the EC_{50} value. We show that there is a change in cellular metabolism upon 14-day bosentan exposure with metabolome hinting at subcellular changes to adapt to cell stress. In conclusion, such human *in vitro* models will not only be in valuable in the screening of compounds with cholestatic potential but also in the understanding of the disease.

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