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Study of phytoestrogens on ameliorating advanced glycation end products-induced HUVECs damage

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Vasculopathy, including endothelial cell apoptosis and inflammation contributes to the high incidence of stroke and myocardial infarction in diabetic patients. Abundant studies have demonstrated the pivotal role of advanced glycation end products (AGEs) on the development of diabetic-vasculopathy. The author and team demonstrated in their study that calycosin, a phytoestrogen, can ameliorate AGEs-induced HUVECs damage. By fluorescence polarization and fluorescence absorption assays, it was observed that calycosin interacted with AGEs in a time-dependent manner. Further studies found that calycosin entered into the cells as detected by HPLC. By MTT method, it was found that calycosin significantly ameliorated AGEs-induced HUVECs apoptosis. Calycosin preincubation dramatically increased anti-apoptotic Bcl-2 while decreased pro-apoptotic Bax & Bad expressions as detected by immunocytochemistry. Moreover, calycosin ameliorated macrophage migration and adhesion to HUVECs; the monocyte chemotactic protein-1 and interleukin-6 levels in the culture supernatant were dramatically reduced by calycosin as determined by ELISA; and the expressions of inflammatory proteins including ICAM-1, TGF- β 1 and RAGE at both protein and mRNA levels were significantly reduced to the normal level by calycosin pretreatment as determined by immunocytochemistry and real-time RT-PCR. The intracellular investigation suggested that calycosin could reverse AGEs-activated ERK1/2 and NF- κ B p65 phosphorylation and nucleus translocation, in which estrogen receptors were involved in. The present study strongly indicates that calycosin can enter into the cell and modulate endothelial cell dysfunction by ameliorating AGEs-induced cell apoptosis and inflammation.

Biography

You-Hua Xu has completed his PhD at the age of 29 years from Macau University of Science and Technology and now serving as Assistant Professor and PI at State Key Laboratory of Quality Research in Chinese Medicine, Faculty of Chinese Medicine, Macau University of Science and Technology. He has published more than 30 papers in reputed journals. He is an expert reviewer for several scientific journals.

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