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Chai-Wen Tsai et al., Clin Exp Pharmacol 2016, 6:4(Suppl)
http://dx.doi.org/10.4172/2161-1459.C1.013

3rd World Congress on

Pharmacology

August 08-10, 2016 Birmingham, UK

Carnosic acid prevents 6-hydroxydopamine induced-apoptosis associated with modulation ARTS and XIAP by parkin in SH-SY5Y cells

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Understanding the neuroprotective effects of carnosic acid (CA) from rosemary has attracted increasing attention in recent years. Parkin promotes the degradation of mitochondria pro-apoptotic ARTS (apoptosis-related protein in the TGF-β signaling pathway) protein and prevents it antagonizes XIAP (X-linked inhibitors of apoptosis proteins) leading to caspase activation. In this present study, we explored whether CA could prevent 6-hydroxydopamine (6-OHDA)-induced apoptosis via modulation of ARTS and XIAP by parkin in SH-SY5Y cells. The results showed that pretreatment cells with CA reduced 6-OHDA-induced the nuclear condensation and apoptotic proteins. Treatment cells with 6-OHDA increased ARTS protein and decreased XIAP protein as well as parkin protien. However, CA pretreatment reversed the effect by 6-OHDA. Performing immunoprecipitation using an anti-ARTS antibody, 6-OHDA increased the XIAP protein. In contrast, CA pretreatment reduced XIAP protein and increased ubiquitin protein in 6-OHDA treated cells. Silencing of XIAP reduced the CA inhibited 6-OHDA-increased the cleavage of caspase 9, 3, 7 and PARP. With parkin siRNA, CA reversed the 6-OHDA-induced ARTS and reduced XIAP was inhibited, which resulted in increasing apoptotic related proteins. In conclusion, CA protects SH-SY5Y cells against 6-OHDA-stimulated apoptosis via induction of parkin by enhancing the ubiquitination of ARTS, leading to induction of XIAP.

Biography

Chia-Wen Tsai received her PhD degree (2006) in Department of Nutrition from Chung Shan Medical University. She has been working as a Associate Professor at the Department of Nutrition, China Medical University in Taiwan. Her research interests include the herbs in prevention of neurodegenerative diseases, the modulations of glucose and lipid metabolism in herbs, and the functional foods in cancer chemoprevention.

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