Artemisinin protected neuronal cells from oxidative insult via the MAPK pathway

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Artemisinin, also known as Qinghao su, isolated from Artemisia annua, is a drug that possesses the most rapid action of all current drugs against Plasmodium falciparum malaria. It is clinically safe, potent and effective in human. At present study, we found that artemisinin promoted the survival of various cell types such as PC12 cells and primary cortical cultured neurons from oxidative insults. For example, pretreatment of PC12 cells with artemisinin significantly suppressed SNP/H2O2-induced cell death by decreasing the production of intracellular reactive oxygen species (ROS), preventing the decline of mitochondrial membrane potential, restoring abnormal changes in nuclear morphology and reducing LDH and caspase 3/7 activities. Western blotting analysis showed that artemisinin was able to stimulate the phosphorylation/activation of extracellular regulated protein kinases (ERK) kinase and CREB while had no effect on the Akt pathway. In addition, ERK signaling pathway inhibitor PD98059 blocked the protective effect of artemisinin whereas the PI3K inhibitor LY294002 had no effect. Taken together, these results suggest that artemisinin as a potential neuroprotectant is able to suppress various oxidative stress-induced neuronal cell deaths via the activation of ERK signaling. Our results offer support for the potential development of artemisinin to prevent neuronal degenerative disorders.

Biography

Wenhua Zheng is currently an Associate Professor, Principle Investigator in Faculty of Health Science, University of Macau, leading a group of scientists working on aging and neuronal degenerative disorders. He is also an Editor of "Chinese Journal of Biology" and an Adjunct Professor at RMIT University in Australia. He has obtained his Medical degree and MSc at Zhongshan University in China and PhD at McGill University, Canada. He was awarded several Post-doctoral research training positions in prestigious research institutes and universities such as NIH and McGill University. In 2015, he has joined University of Macau.

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