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Plant derived flavonoid puerarin activates progesterone receptor signaling pathway in neurons: A neuroprotective and neurotrophic mechanism?

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Parkinson's disease (PD) is a common neurodegenerative disease impairing motor coordination, cognition and other autonomic nervous functions in many elderly humans. The existing treatments mainly improve symptoms in PD patients. The aim of this study was to elucidate the molecular mechanisms by which botanical compound puerarin protects neurons from oxidative injury and promotes neuritogenesis. We first investigated the neuroprotective and neurotrophic activities of puerarin in MPTP-lesioned mice model, as well as primary rat mesencephalon neurons. The effects of Puerarin on TH expression were assayed by western blotting. The neuronal viability was assessed by Hoechst 33342/Propidium Iodide staining. Neurite outgrowth was determined by commercial neurite outgrowth kit and immunofluorescence analysis. The role of progesterone receptor was verified by siRNA-mediated gene silencing technology. We found that puerarin protected dopaminergic cells and ameliorated the behavioral impairments in MPTP-lesioned mice. Moreover, puerarin not only enhanced neuronal survival against MPP+ induced neurotoxicity but also potentiated NGF-induced neuritogenesis via progesterone receptor dependent manner. Thus, our results suggest for the first time that puerarin may interact with progesterone receptor to elicit the neuroprotective and neurotrophic activities against neurodegeneration.
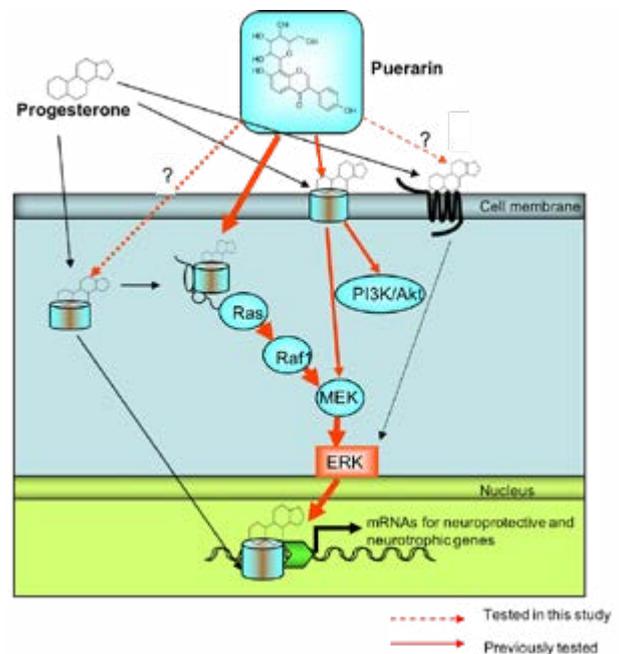
Biography

Yingke Zhao is currently a 3rd-year PhD candidate in School of Chinese Medicine at the University of Hong Kong. She is focusing on the neuroprotective and neurotrophic activities of Chinese medicine and acupuncture towards her PhD degree.

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