Ginkgolide

Ginkgolides are biologically active terpenic lactones present in Ginkgo biloba. They are diterpenoids with 20-carbon skeletons, which are biosynthesized from geranylgeranyl pyrophosphate.

Finding novel agent for cerebral ischemia therapy is urgently required. In a study, Gao et al., aimed to investigate the regulatory mechanism of Ginkgolides B (GB) in hypoxia-injured PC12 cell lines.

PC-12 cells were exposed to hypoxia and administrated with GB. Cell viability was detected by MTT assay. Flow cytometry assay was conducted for the detection of cell apoptosis, ROS generation and cell cycle assay. The changes of protein levels of Bax, Pro/Cleaved-Caspase-3, CyclinD1, CDK4, CDK6, PI3K/AKT and MEK/ERK pathways were detected by Western blot. Transfection was conducted for Polo-like kinase 1 (PLK1) knockdown.

Hypoxia-induced decrease of cell viability and increase of ROS generation, apoptosis and cell cycle arrest were ameliorated by GB. Hypoxia disposition hindered PI3 K/AKT and MEK/ERK signaling pathways while GB had the opposite effects. Then we observed that hypoxia exposure suppressed PLK1 expression while GB increased PLK1 expression dose-dependently. Knockdown of PLK1 attenuated the neuroprotective effects of GB on hypoxia-injured PC-12 cells and also inhibited PI3 K/AKT and MEK/ERK pathways.

The above observations corroborated that GB alleviated hypoxia-induced PC-12 cell injury by up-regulation of PLK1 via activating PI3K/AKT and MEK/ERK pathways. These findings implied the neuro-protective impacts in hypoxia-injured PC-12 cells [1)].

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Gao J, Kang M, Han Y, Zhang T, Jin H, Kang C. Ginkgolides B alleviates hypoxia-induced PC-12 cell injury by up-regulation of PLK1. Biomed Pharmacother. 2019 Apr 25;115:108885. doi: 10.1016/j.biopha.2019.108885. [Epub ahead of print] PubMed PMID: 31029888.