PC12 cell line

PC12 is a cell line derived from a pheochromocytoma of the rat adrenal medulla, that have an embryonic origin from the neural crest that has a mixture of neuroblastic cells and eosinophilic cells.

The PC12 cell line has been used to get more information about diseases of the brain. It has been used in research of hypoxia, where acute hypoxia induces exocytosis and prolonged hypoxia can induce excessive exocytosis. PC12 cells were used to find which prion protein fragments caused neuronal dysfunction.

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.