Accepted Manuscript

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PII: S0024-3205(18)30394-1
DOI: doi:10.1016/j.lfs.2018.07.016
Reference: LFS 15803

To appear in: *Life Sciences*

Received date: 10 May 2018
Revised date: 5 July 2018
Accepted date: 10 July 2018

Please cite this article as: Wenjing Cheng, Weimei Chen, Peng Wang, Jianfeng Chu , Asiatic acid protects differentiated PC12 cells from Aβ25–35-induced apoptosis and tau hyperphosphorylation via regulating PI3K/Akt/GSK-3β signaling. Lfs (2018), doi:10.1016/j.lfs.2018.07.016

Asiatic acid protects differentiated PC12 cells from $A\beta_{25-35}$-induced apoptosis and tau hyperphosphorylation via regulating PI3K/Akt/GSK-3β signaling

Running title: AA benefits $A\beta_{25-35}$-treated differentiated PC12 cells

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Declaration of conflict of interest: None.

Abstract

Amyloid β (Aβ) peptide can cause neurotoxicity in Alzheimer's disease (AD). The main purpose of the present study is to investigate the protective role of asiatic acid (AA) against $A\beta_{25-35}$-induced neurotoxicity in neuronally differentiated PC12 cells. Differentiated PC12 cells were pretreated with 5, 10 or 20 μM AA before treatment with 20 μM $A\beta_{25-35}$. The viability and apoptosis of differentiated PC12 cells were determined by MTT assay and Annexin V-FITC/PI double staining, respectively. The mitochondrial membrane potential (MMP) of differentiated PC12 cells was analyzed by JC-1 staining. The expression levels of proteins were detected by western blot analysis. We found that AA significantly increased the viability of differentiated PC12 cells but attenuated the mitochondria-mediated apoptosis dose-dependently when challenging with $A\beta_{25-35}$. Besides, the results of western blot analysis showed that AA