

عنوان مقاله:

Neuroprotective, Neurodifferentiative, and Anti-Neuroinflammatory Effects of Ferulic Acid

محل انتشار:

بیست و یکمین کنگره پزشکی تولید مثل و شانزدهمین کنگره زیست شناسی و فناوری سلول های بنیادی (سال: 1399)

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خلاصه مقاله:

Objective: Ferulic acid (FA) as a phenolic phytochemical has many medicinal properties that have been proven to have anti-oxidant and protective effects on various cell types, including neurons. However, studies on its effects on other biological pro-cesses, such as inducing neuronal differentiation and the stimu-latory effect on the change of microglia phenotype from M₁ to M₂, are very limited. **Materials and Methods:** In a series of studies on PC₁₂ cells, neuronal precursors, and microglia cells, we found that these neurons reacted differently to different concentrations of the compound. In these experiments, we treated PC₁₂, NSC and microglia cells with different concentrations of FA and evalu-ated the expression of genes and proteins involved in differentiation, survival and inflammation in different laboratory conditions. Western blotting, quantitative real-time PCR, im-muno-cytochemical staining, survival measurement with MTT assay and morphological studies were used to confirm the find-ings. **Results:** FA specifically promotes the survival of nerve cells and increases their resistance to oxidative stress by stimulating the expression of Sirtuins, especially SIRT 1 and 7. It also in-duces differentiation in NSCs toward neurons through the ERK 1/2 signaling pathway. Regarding induction of differentiation, our studies showed that at high concentrations FA shows this property, while at low concentrations it promotes neuroprotec-tion. Regarding the stimulation of microglia, our study showed that FA in low concentrations has the property of inducing the M₁ to M₂ shift of microglia and thereby reducing the aggres-sive properties of microglia. In this way, FA acts through sup-pression of M₁-inflammatory genes (IL 1 β , IL6, TNF α , OPG) and increasing the expression of M₂-anti-inflammatory mark-ers (IL10, IL4, TGF β). **Conclusion:** Our studies show that FA is not just an antioxidant and can have significant effects on inducing differentiation and reducing inflammation .in the nervous system

کلمات کلیدی:

Ferulic acid, Neuron, Microglia, Differentiation, Pro-tection

