

Cite this as: Tianmeng ZHANG, Kun WANG, Hui FAN, Qiankun YANG, Xiao ZHANG, Feixue LIU, Xin FENG, Yi CHEN, Daoyang TENG, Panpan ZHAO, Jingquan DONG. Ameliorative effect of scutellarin on acute alcohol brain injury in mice[J]. Journal of Zhejiang University Science B, 2022, 23(3): 258-264.
<https://doi.org/10.1631/jzus.B2100763>



Ameliorative effect of scutellarin on acute alcohol brain injury in mice

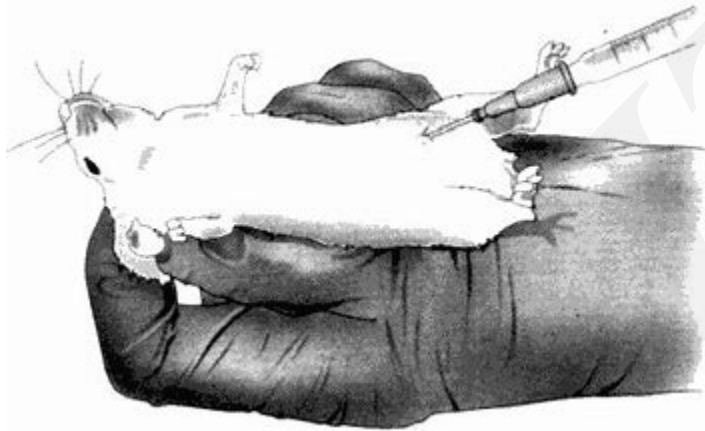
Key words: Alcoholic brain damage, Scutellarin, Inflammation, Oxidative stress

Methods and Results



1、 Experimental design

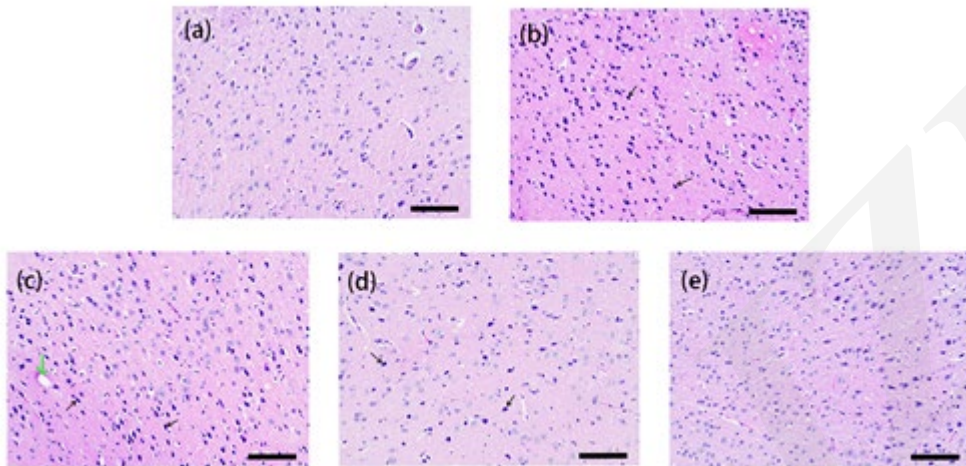
The mice were randomly divided into 5 groups with 6 mice in each group, including the negative control group, alcohol group, scutellarin treatment groups with low/middle/high doses {(10 mg, 25 mg, 50 mg/kg BW + 50% ethanol, 12 mL/kg BW)}. Equal volume of distilled water or scutellarin were injected intraperitoneally (i.p.) once daily for 3 days and alcohol were administered by oral gavage after 12 h since the last injection. Mice were fasted for 12 h after ethanol treatment.





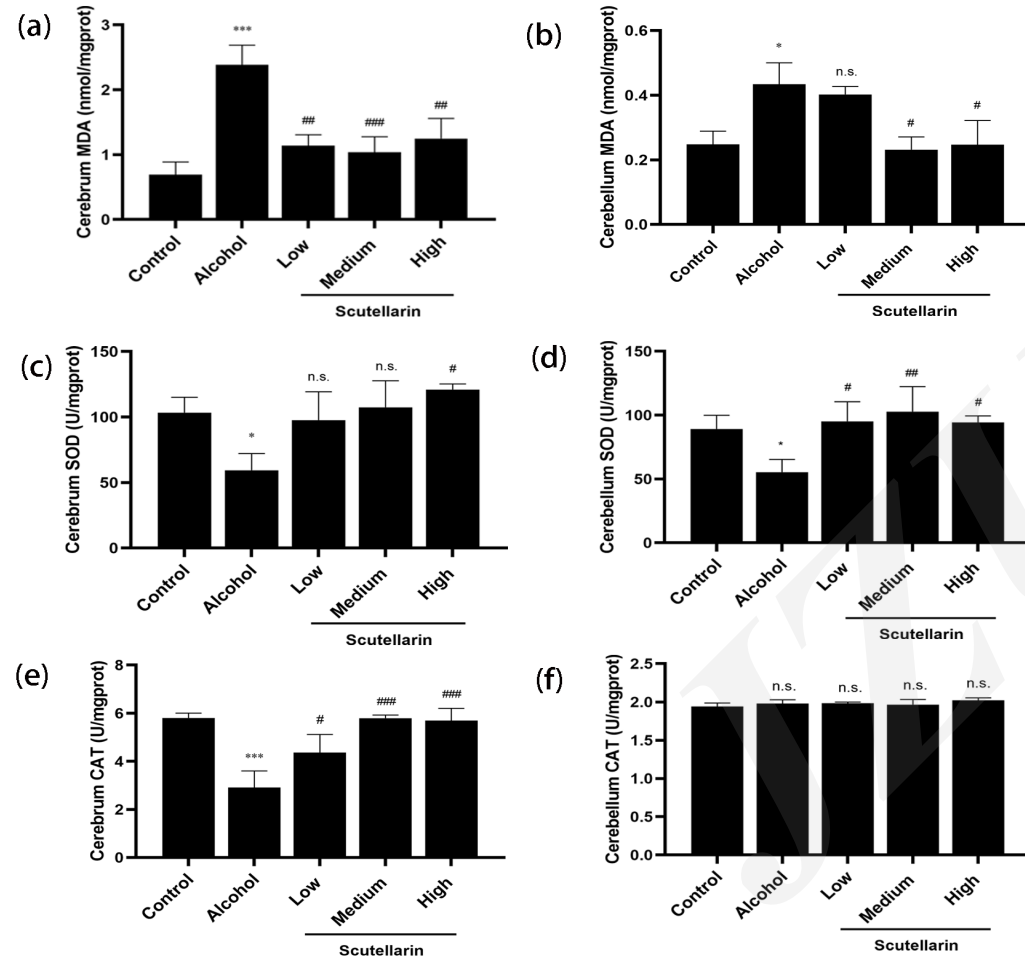
2、Histological analysis

The fresh mouse brain tissues were washed with PBS, soaked in 4% paraformaldehyde for more than 24 h, dehydrated by ethanol, embedded in paraffin, sectioned and stained with hematoxylin and eosin (H&E), and finally examined microscopically.



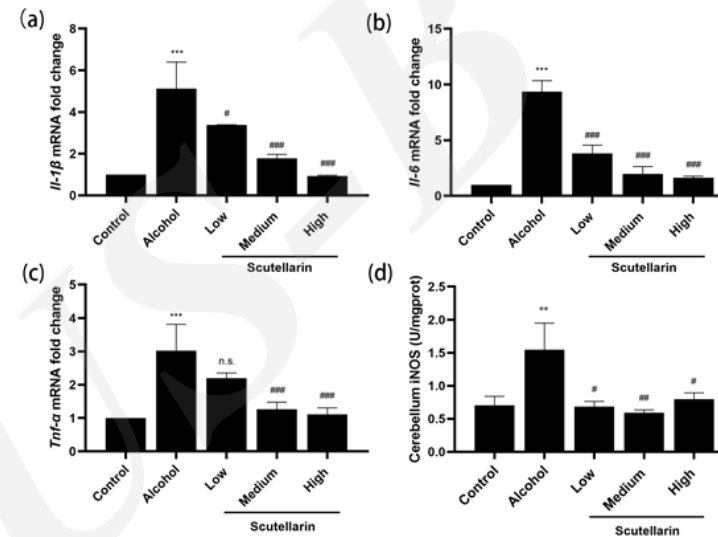
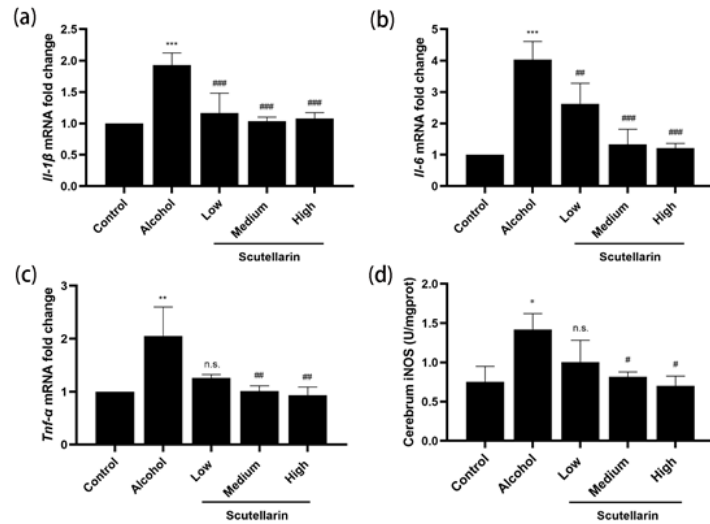
Alcohol stimulated the brain tissue neurons to shrink and dye, and breviscapine pretreatment significantly alleviated these phenomena

3、Biochemical indicators measurement



Alcohol stimulation reduces the activity of antioxidant enzymes, and significantly increases the lipid peroxidation index MDA, while the intervention of scutellarin significantly increases the activity of antioxidant enzymes.

4、Quantitative real-time PCR assay



Scutellarin intervention significantly reduced the abnormal increase of related inflammatory factors caused by alcohol stimulation

conclusion



The research results indicate that acute alcohol exposure is prone to oxidative stress and in-flammation, but these two phenomena can be alleviated by scutellarin by up-regulating antioxidant enzymes activities and down-regulating the expression of inflammatory factors. Scutellarin is proved to be a promising method for the prevention of acute alcoholic brain injury, providing a new idea for the prevention and treatment of clinical diseases.

Innovation points



1、 Scutellarin, as a natural drug with anti-inflammatory, antioxidant and anti-tumor activities, is widely used in hypertension, Diabetes and cardiovascular diseases, but there are few studies on alcohol-induced brain injury. Therefore, in this study, scutellarin was applied to the alcoholic brain injury model.

2、 Based on inflammation and oxidative stress, two popular targets at present, alcohol brain injury research was carried out