Polygalacic acid inhibits MMPs expression and osteoarthritis via Wnt/β-catenin and MAPK signal pathways suppression

Tutor Prof. Jin Qunhua
Reporter Li Xiaojun

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Polygalacic acid inhibits MMPs expression and osteoarthritis via Wnt/β-catenin and MAPK signal pathways suppression

Kai Xu[1], Chiyuan Ma[1], Langhai Xu[1], Jisheng Ran, Lifeng Jiang, Yuzhe He, Safwat Adel Abdo Moqbel, Zhan Wang, Lidong Wu*

Department of Orthopedic Surgery, the Second Affiliated Hospital, Zhejiang University School of Medicine, Hangzhou, People's Republic of China

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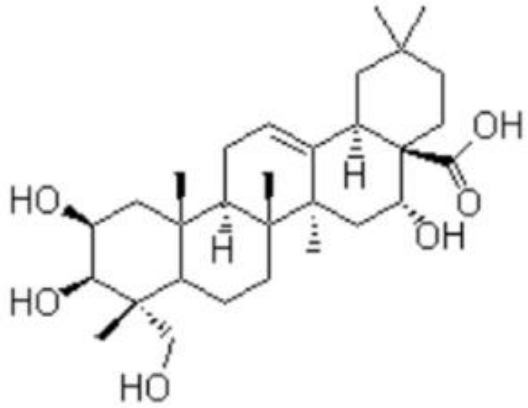
Introduction

远志（学名：Polygala tenuifolia Willd），又名蕒绕、棘菀等。产东北、华北、西北和华中以及四川；多年生草本，主根粗壮，韧皮部肉质。具有安神益智、祛痰、消肿的功能，用于心肾不交引起的失眠多梦、健忘惊悸，神志恍惚，咳痰不爽，疮疡肿毒，乳房肿痛。

A

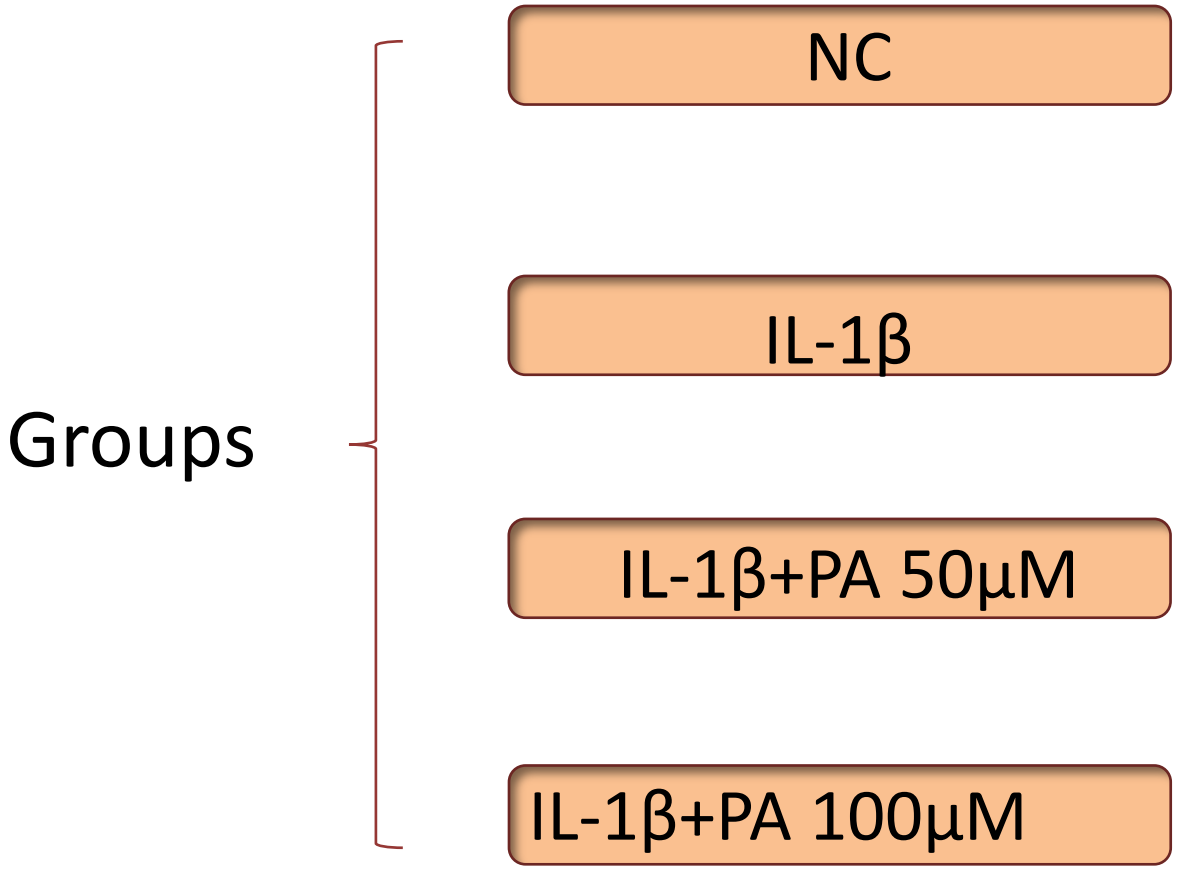


Introduction

Polygalacic acid，is a triterpene, isolated from the root of Polygala tenuifolia Willd. However, nothing has been reported about polygalacic acid in osteoarthritis so far. In the present study, we have examined the inhibitory effects of polygalacic acid on OA and have investigated the potential mechanisms involved.

materials and methods

Cell culture experiments: 6-week-old SD rats'hip jionts

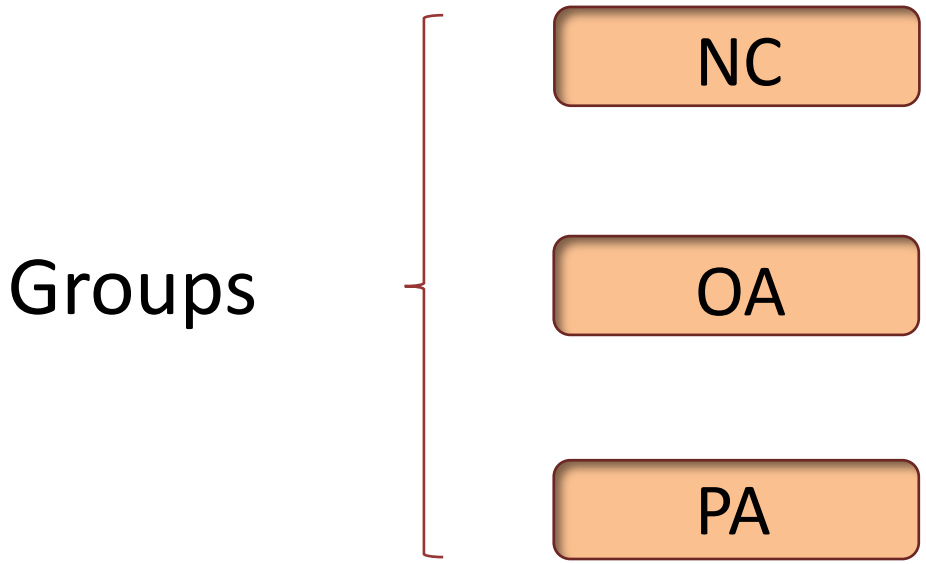


materials and methods

Experimental animals

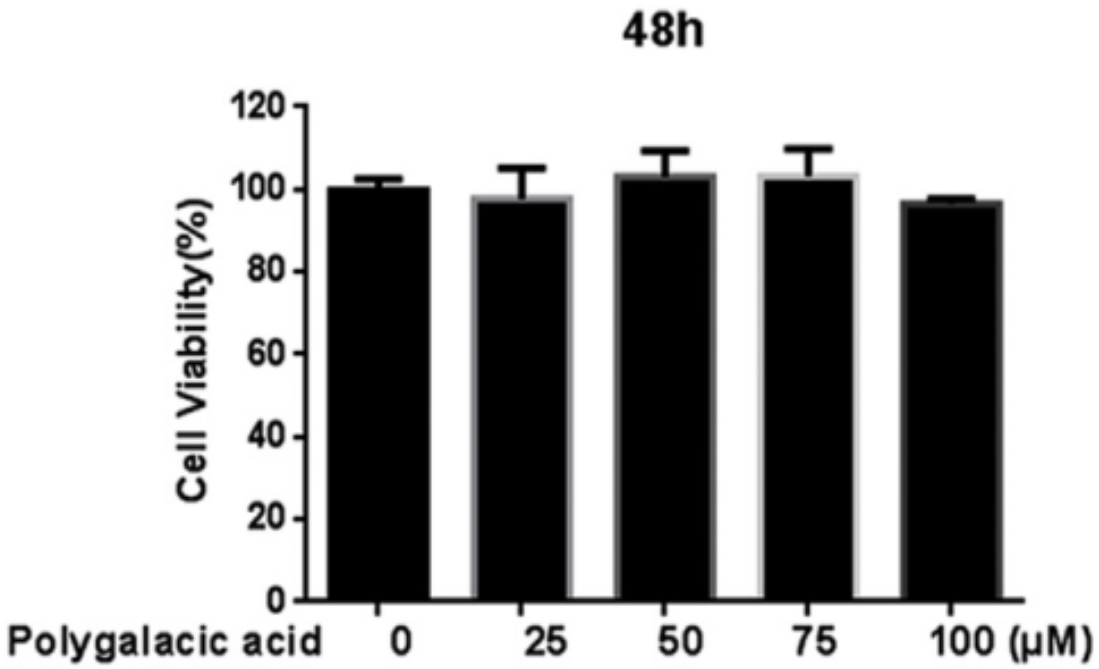
SD rats at 6 weeks of age (200–250 g) were used.

OA model : DMM



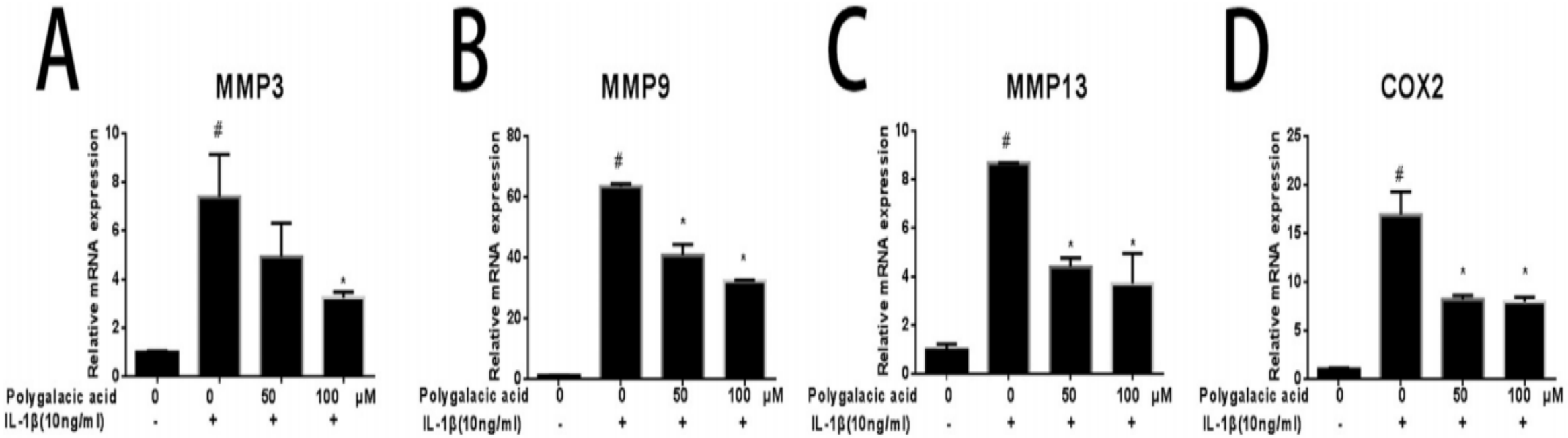
results

Effects of polygalacic acid on chondrocyte viability



results

Effects of polygalacic acid on IL-1β-induced inflammation and the expression of MMP-3, MMP-9, MMP-13, and COX-2 in chondrocytes



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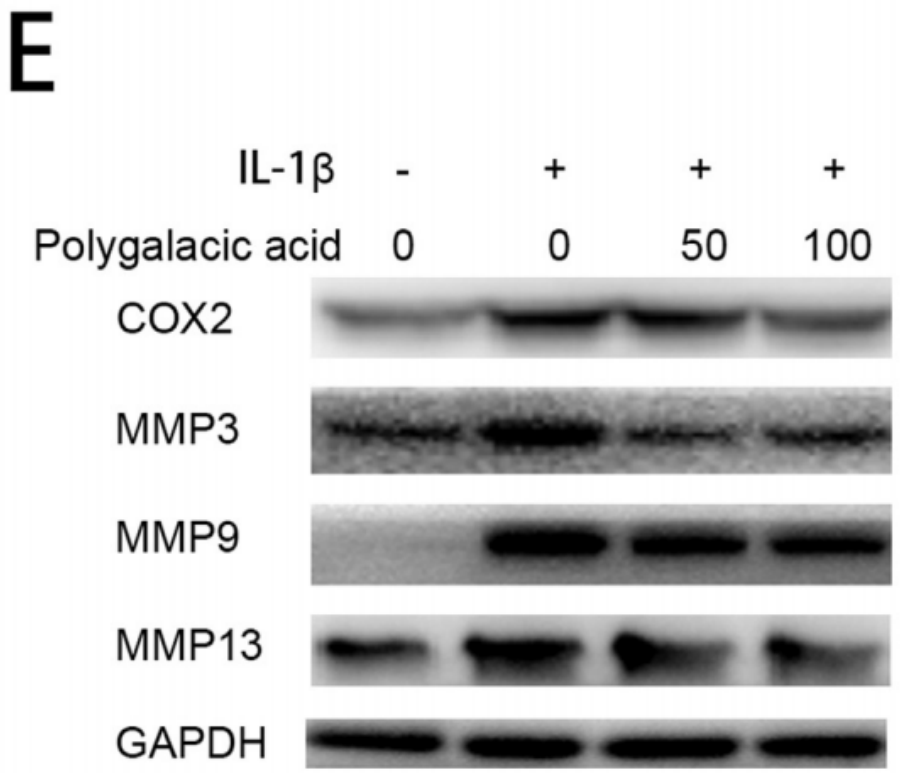
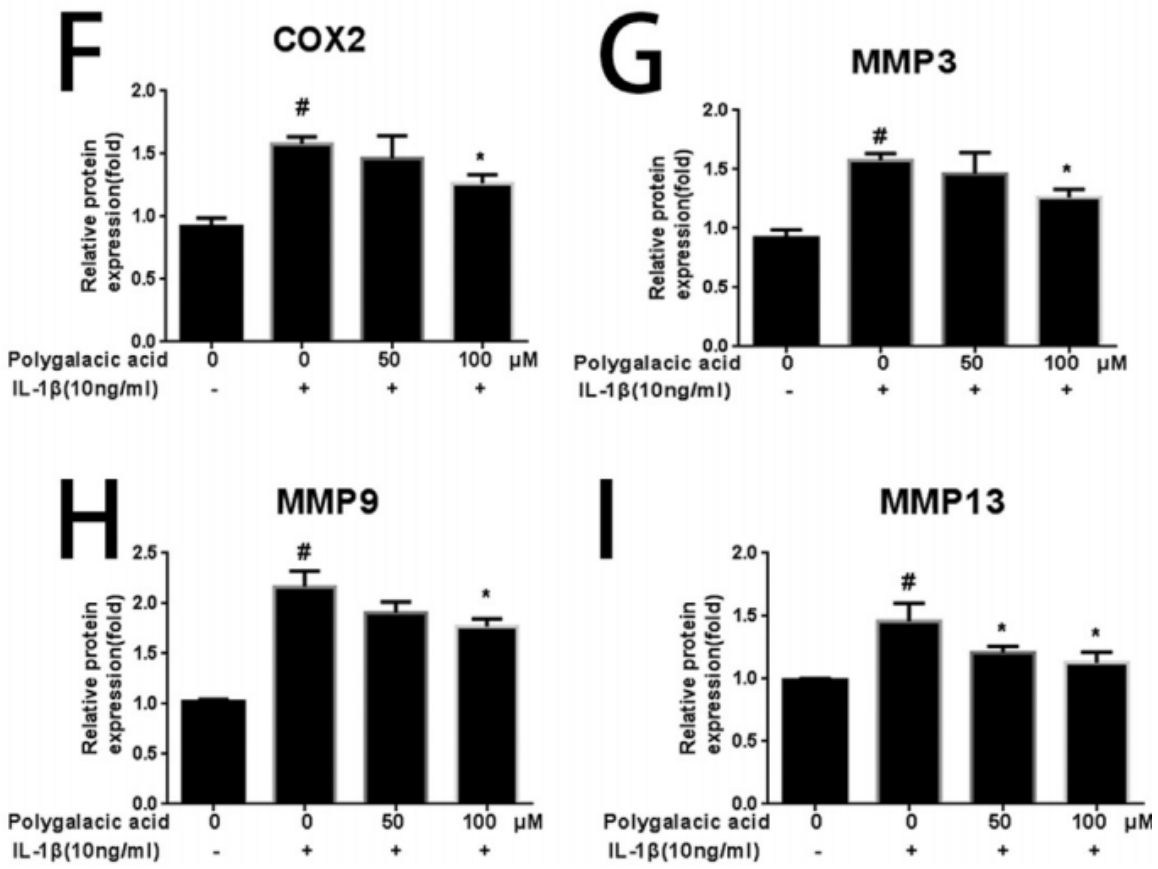
Effects of polygalacic acid on IL-1β-induced inflammation and the expression of MMP-3, MMP-9, MMP-13, and COX-2 in chondrocytes



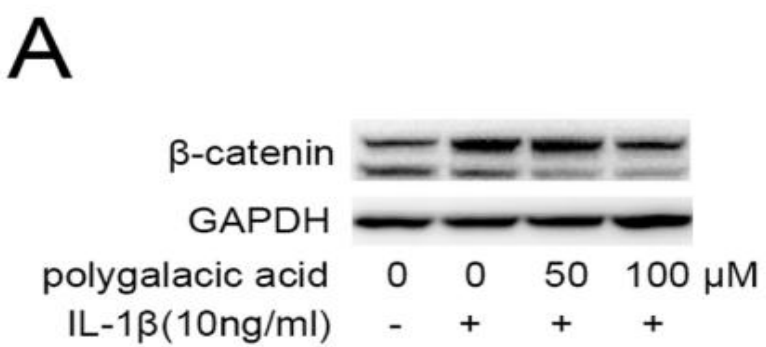


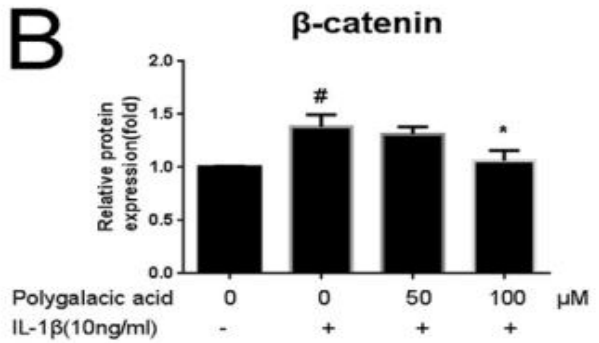
results

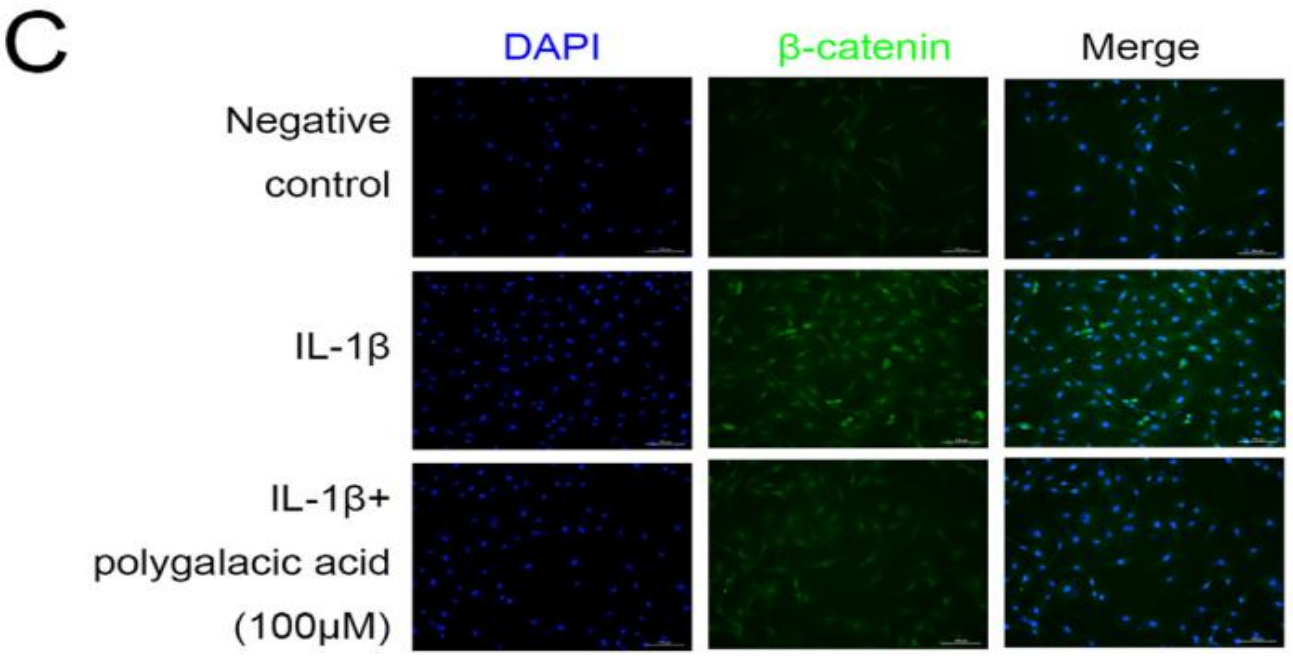
Effects of polygalacic acid on IL-1β-induced inflammation and the expression of MMP-3, MMP-9, MMP-13, and COX-2 in chondrocytes

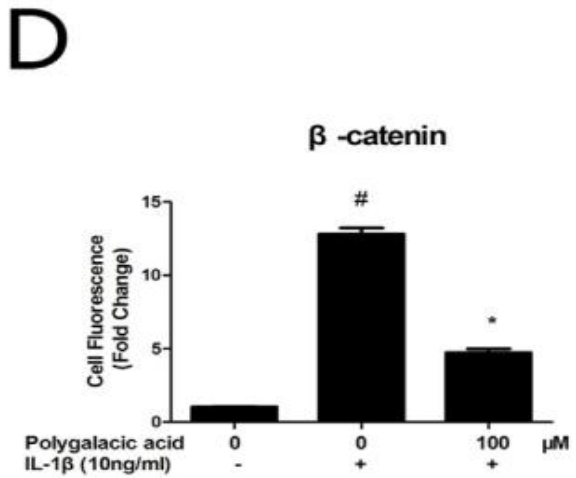
results

Effects of polygalacic acid on IL-1β-induced Wnt/β-catenin signaling pathway activation in chondrocytes



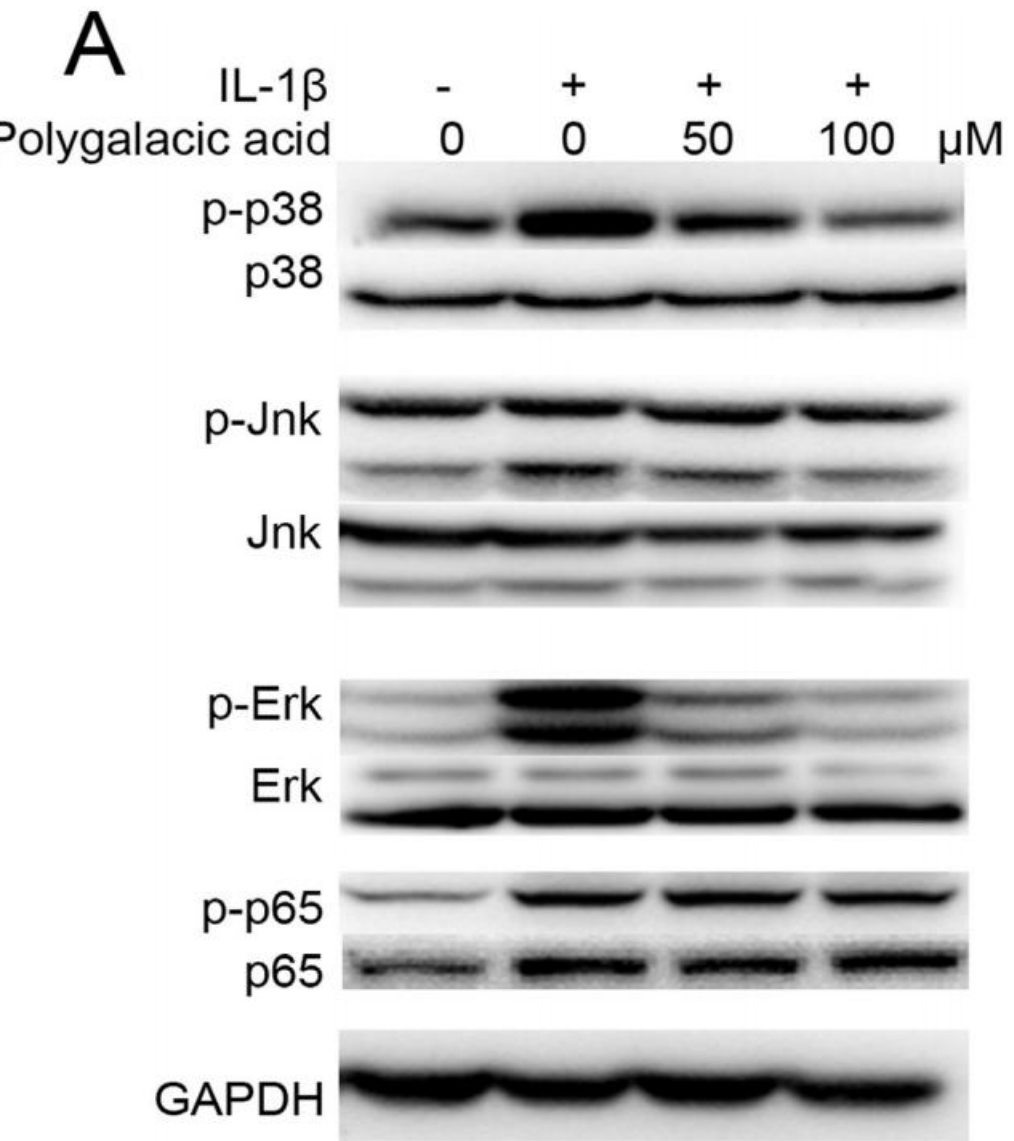


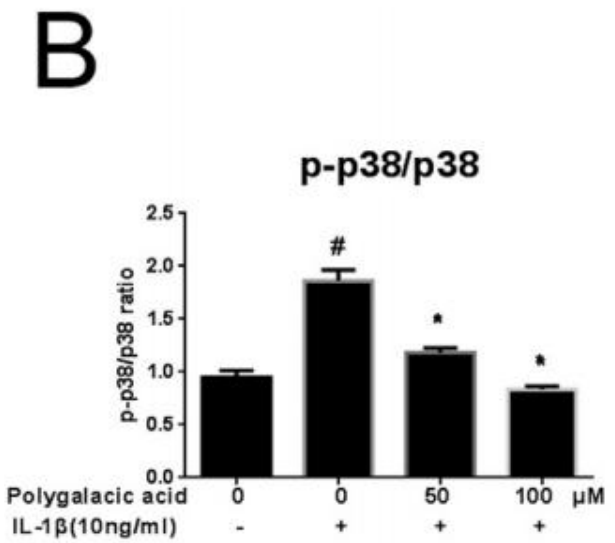


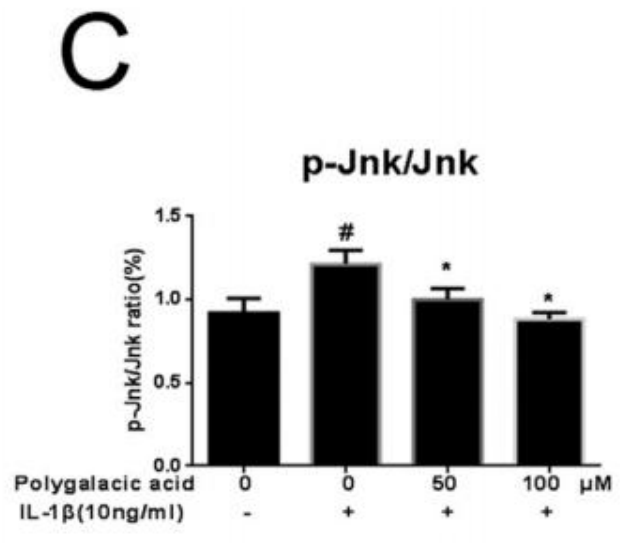


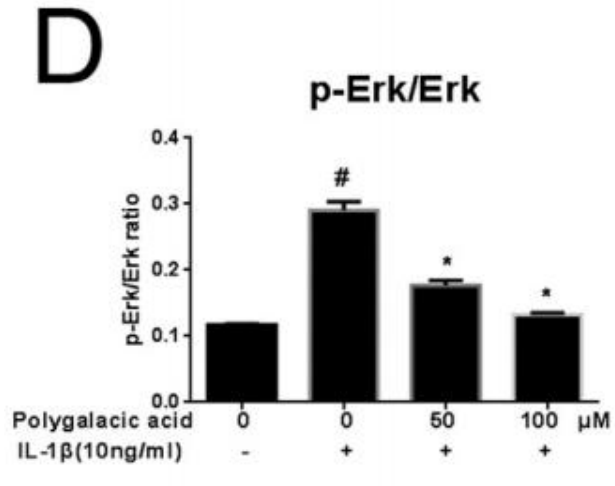
results

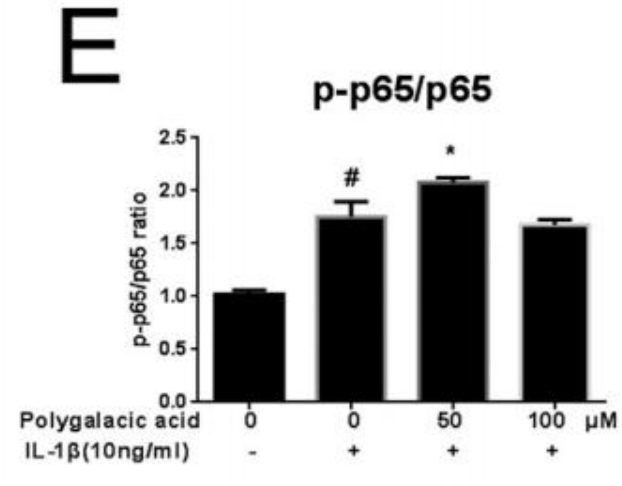
Effects of polygalacic acid on IL-1β-induced mitogen-activated protein kinase (MAPK) and NF-κB signaling pathways in chondrocytes





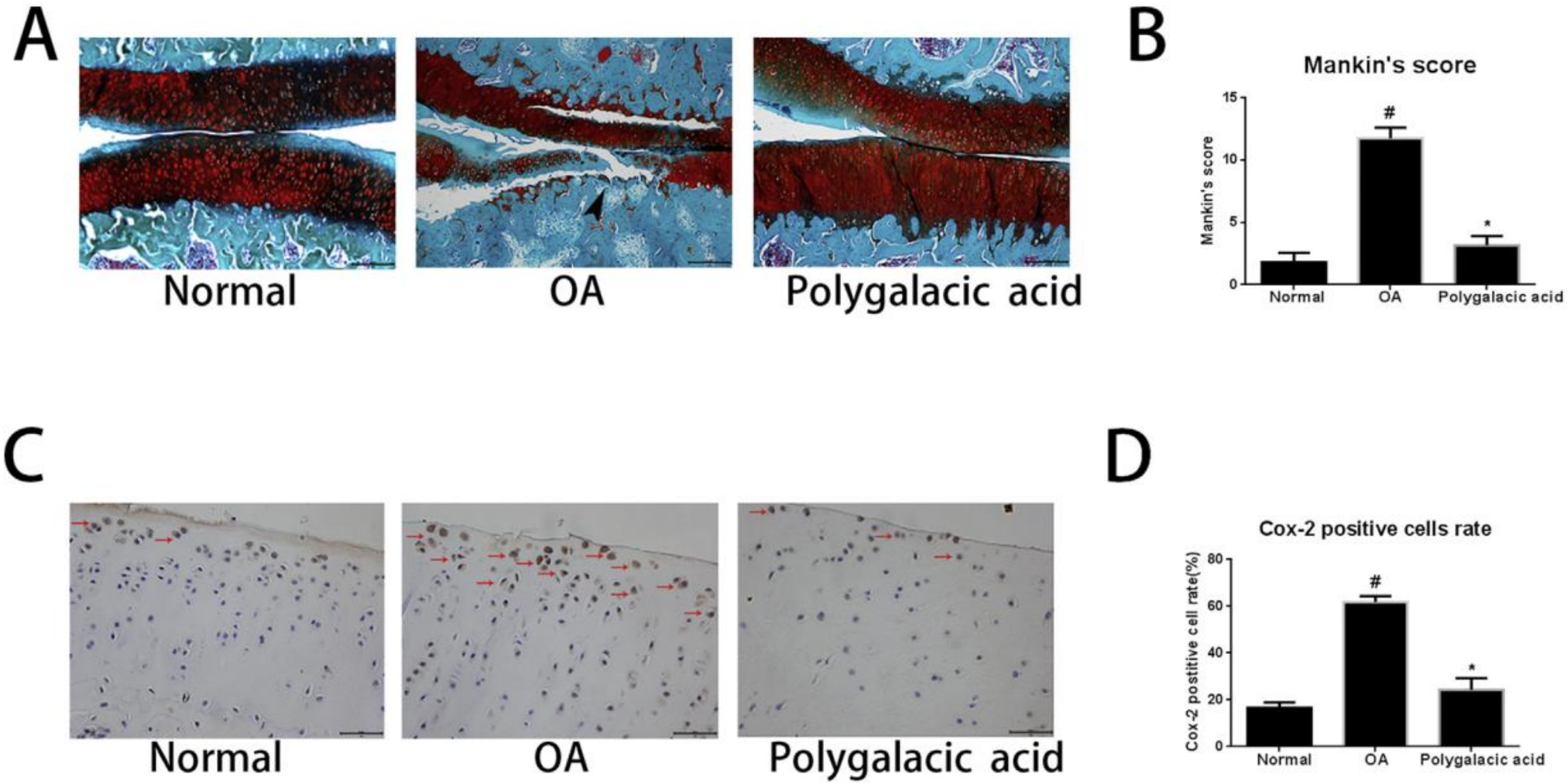






results

Protective effects of polygalacic acid in the rat OA model



results

Protective effects of polygalacic acid in the rat OA model

Ⅰ软骨组织结构 积分	Ⅱ细胞数量 积分
正常 0	正常 0
排列紊乱但层次可分 1	轻度增生 1
排列明显不规则，层次紊乱 2	中度增生 2
严重紊乱 3	重度增生 3

Ⅲ AB-PAS染色 积分	Ⅳ潮线 积分
正常 0	正常 0
轻度减低 1	多层次 1
中度减低 2	模糊 2
严重减低 3 不着色 4	有血管穿过 3

Discussion

OA is a prevalent joint disease in aging population. Recent statistics showed that about 9.29% of the US population has been diagnosed with symptomatic knee OA by age 60 . Also, the overall prevalence of OA is still increasing.

Discussion

Polygala tenuifolia Willd is a traditional Chinese medicine. Various studies showed that it exerted several properties, such as anti-inflammatory, neuroprotective effects, antitumor, and anti-oxidant .Polygalacic acid is a triterpene isolated from the root of Polygala tenuifolia Willd. Various studies demonstrated that polygalacic acid had anti-inflammatory effects.

Discussion

Growing evidence indicates that MMPs participated in cartilage degradation in OA. MMPs are big family of enzymes, including MMP-1, MMP-2, MMP-3, MM-9 and MMP-13. Among these enzymes, MMP-3, MMP-9 and MMP-13 are well known to play crucial role in OA .

Conclusions

In conclusion, this study first demonstrated that polygalacic acid inhibited MMPs expression and chondrocyte inflammation via suppressio n of both the Wnt/β-catenin and MAPK signal pathways in rat chondrocytes. Animal experiments showed that polygalacic acid could be a therapeutic agent for OA treatment.

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THANK YOU!