

Abstract

Osteoarthritis (OA) is a degenerative disease, the main cause is due to mechanical stimulation of bones and the aging. The cartilage damage accompanies bone, lesions synovial inflammation and osteophyte with the progress of chronic pain are the main symptoms of osteoarthritis. In this study, we investigate the protective effects of bioactive substance (OA-4018) which isolated from Taiwan-cultured red al on osteoarthritis in rats. In preliminary experiment, RAW264.7 macrophage cells was used for cytotoxicity and anti-inflammatory test. The results showed that OA-4018 did not significantly affect the cell viability, and also inhibited the expression of pro-inflammatory protein. *In vivo* study, the anterior cruciate ligament transection (ACLT)-induced OA model was used, and OA-4018 significantly reduced mechanical allodynia, weight-bearing deficits and knee swelling in ACLT-rats. In summary, OA-4018 show significant effects on suppressing pain and joint swelling in ACLT-rats. In the future, pathological analysis and immunohistochemical staining will be used for explore the protective mechanism of OA-4018 on cartilage, and we look forward the future application of red algae on osteoarthritis.

Materials and methods

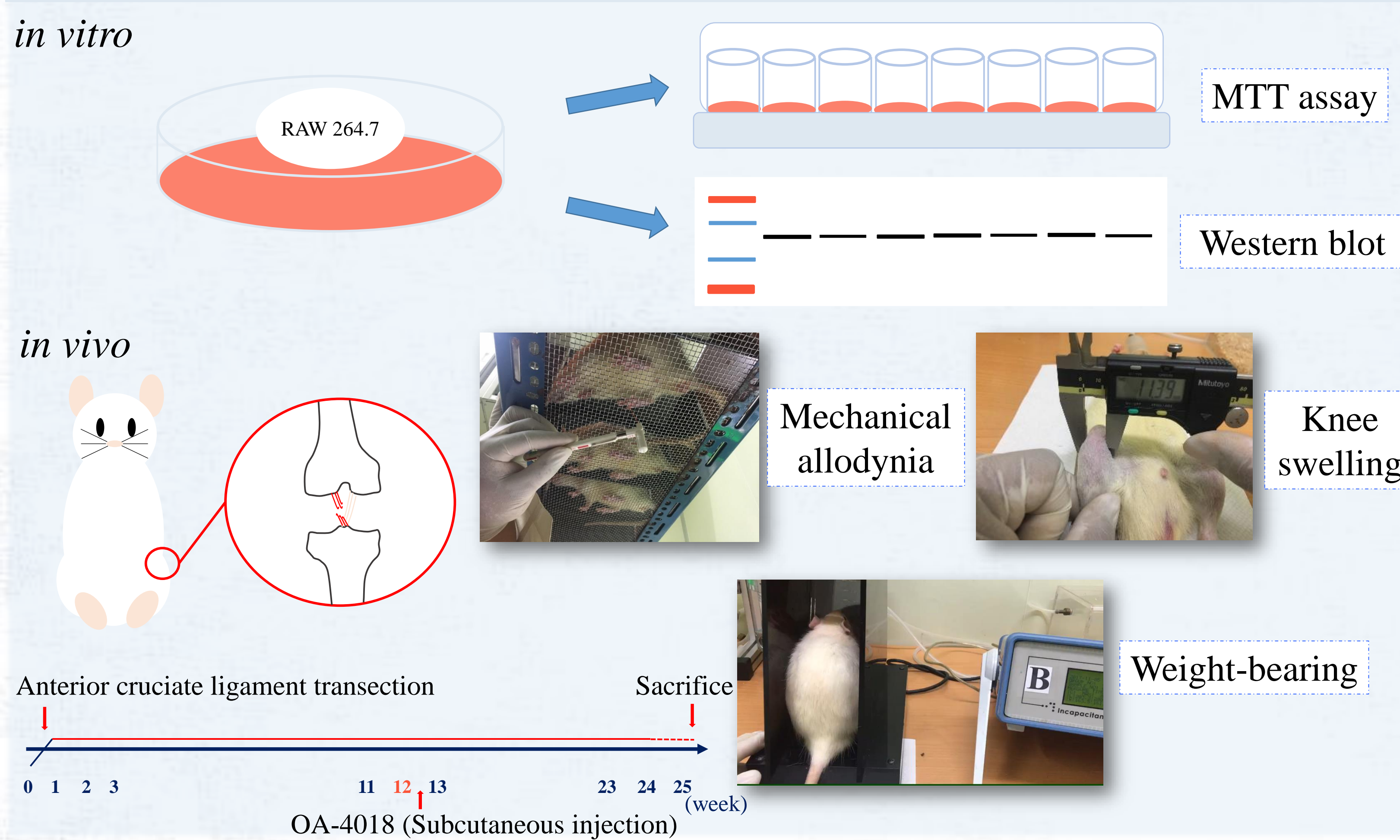


Figure 1. Effect of OA-4018 on the viability of RAW 264.7 macrophage cells.

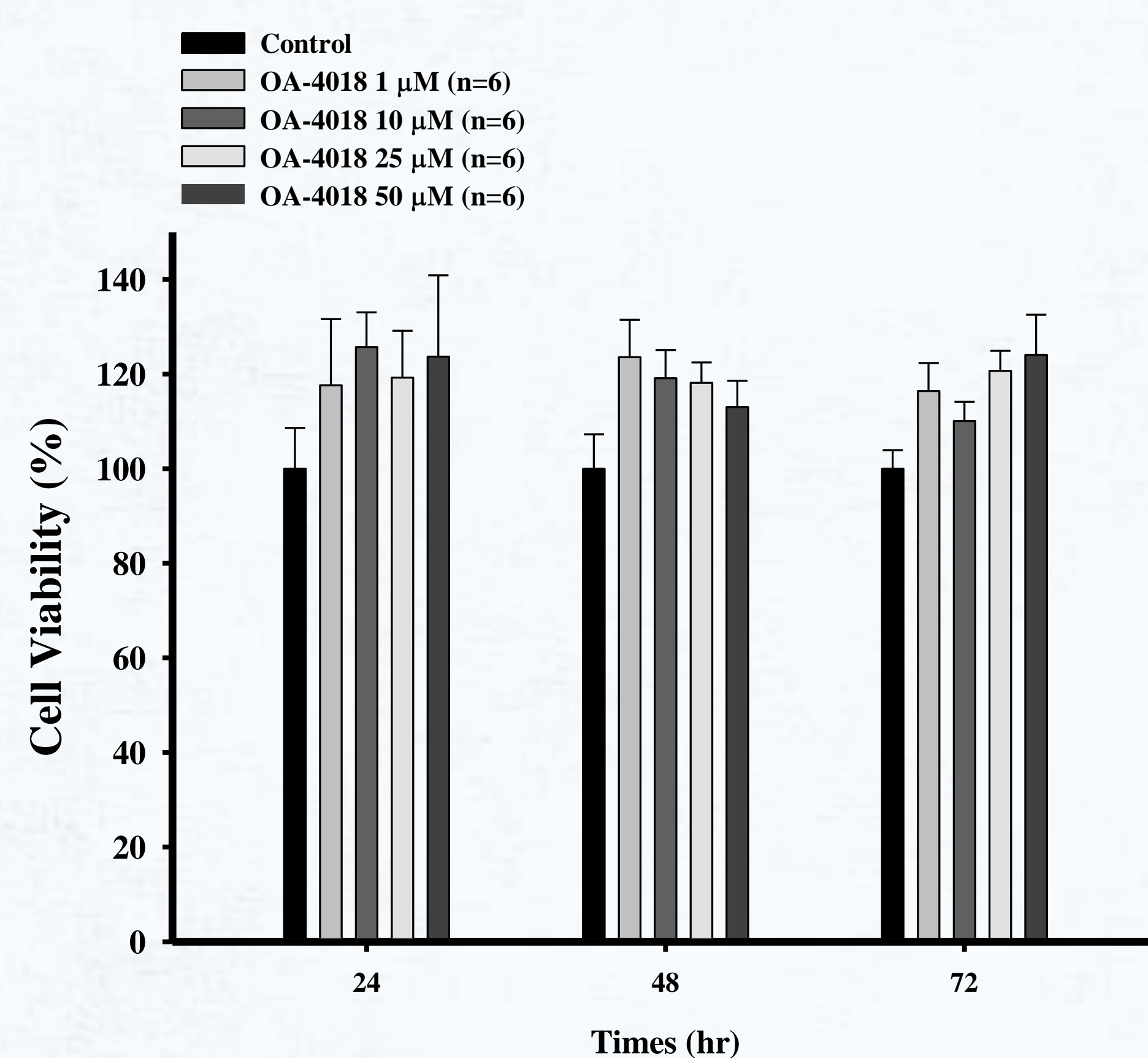
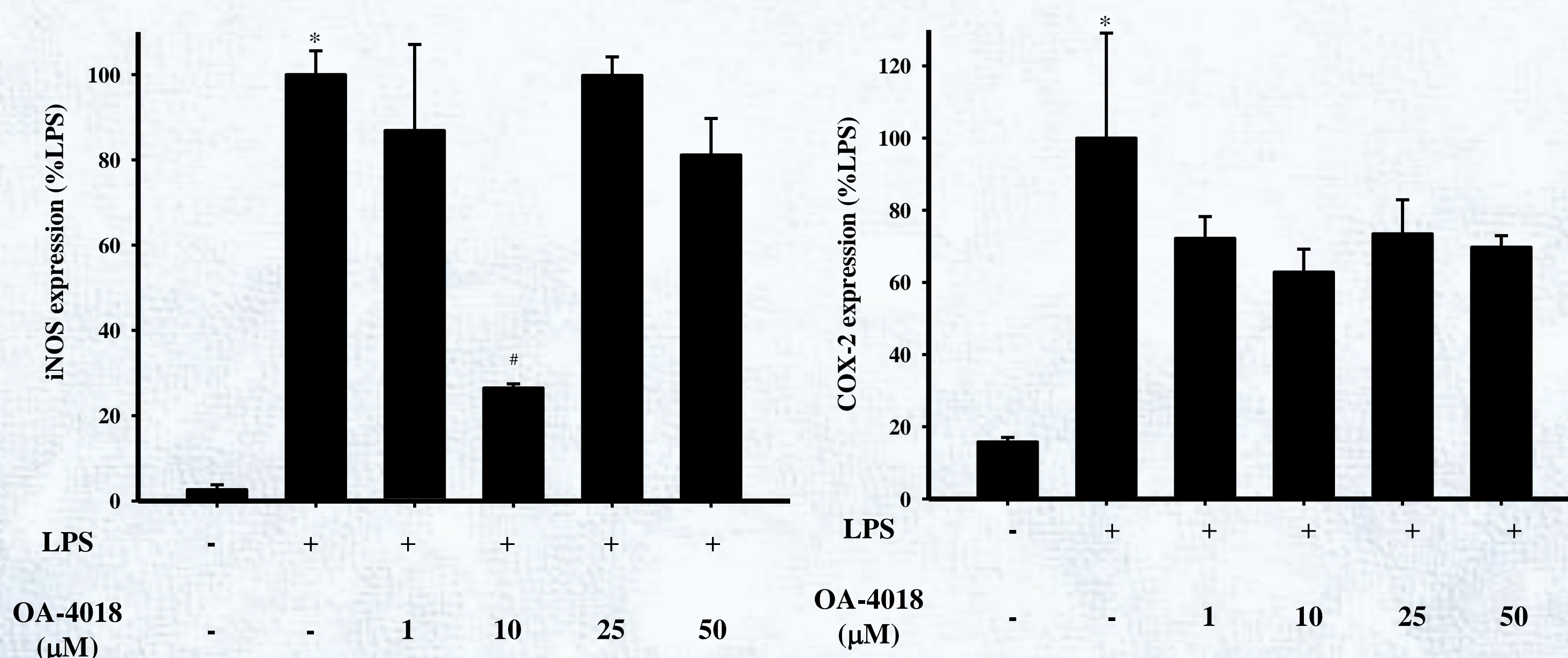
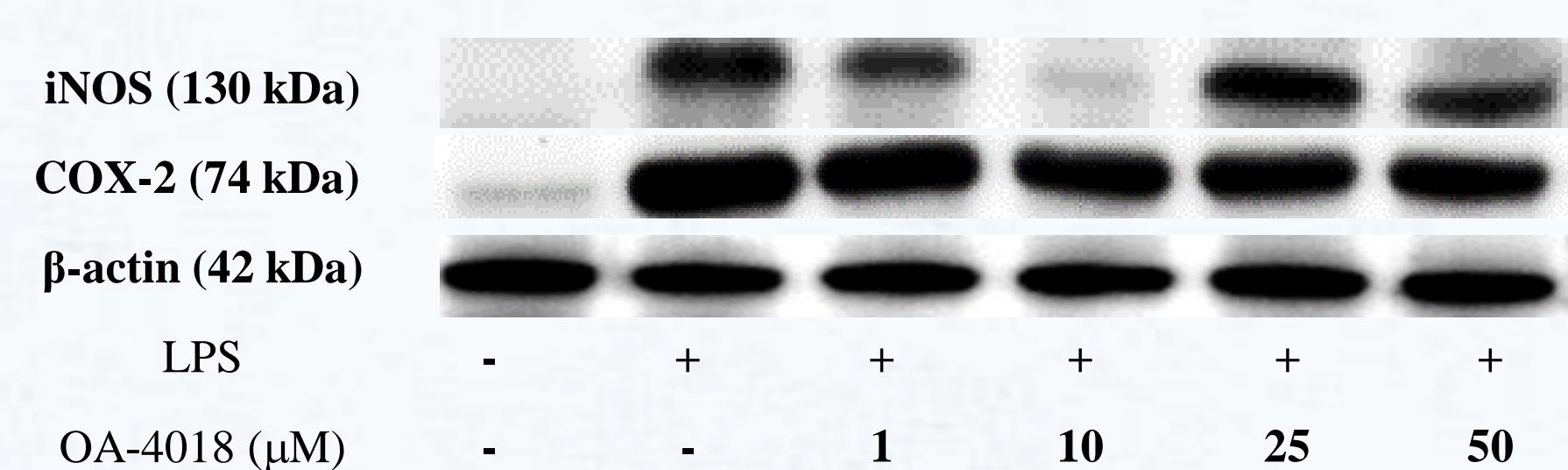


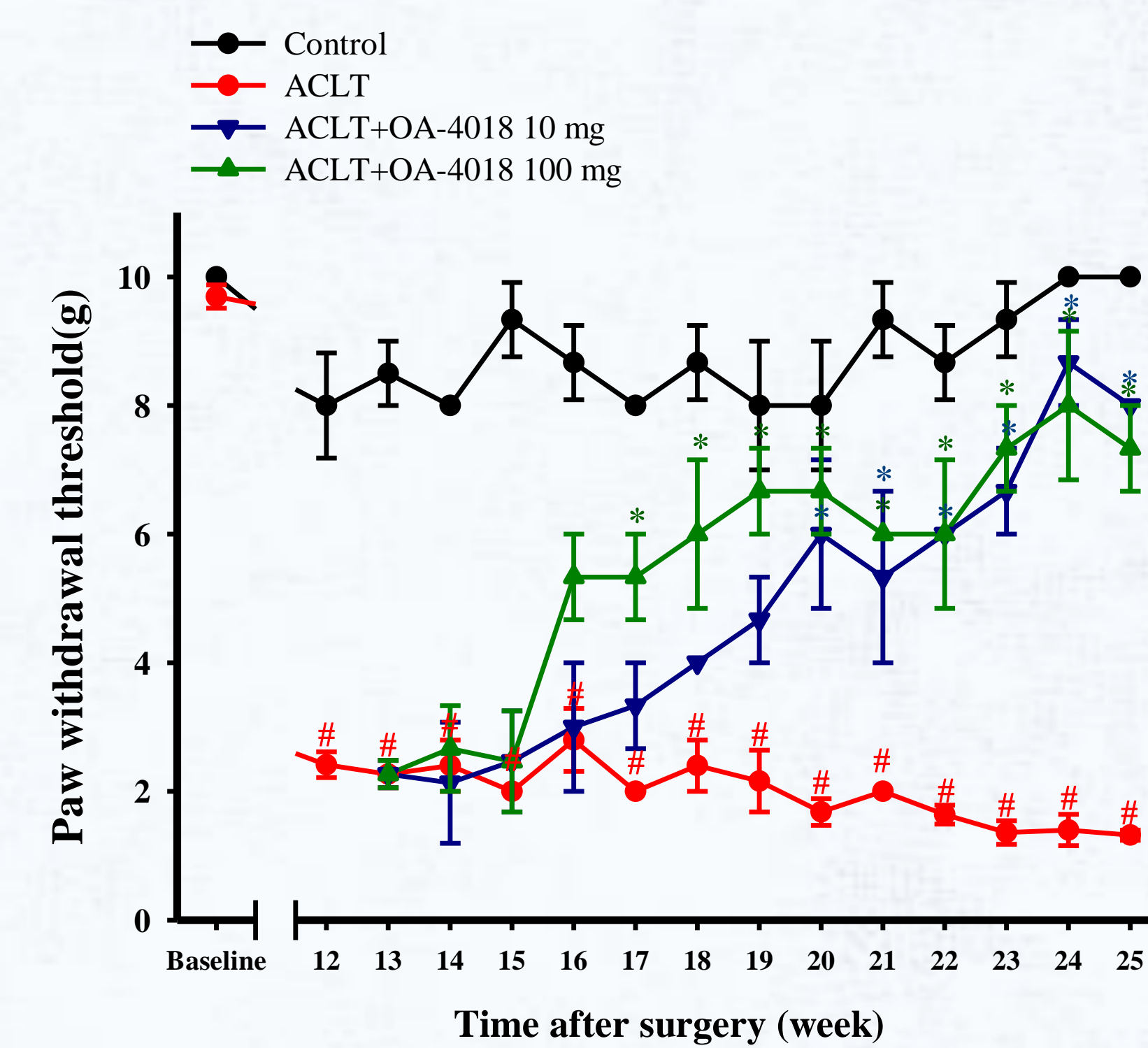
Figure 2. Effect of OA-4018 on iNOS and COX-2 Protein expression in LPS-induced RAW 264.7 Cells.



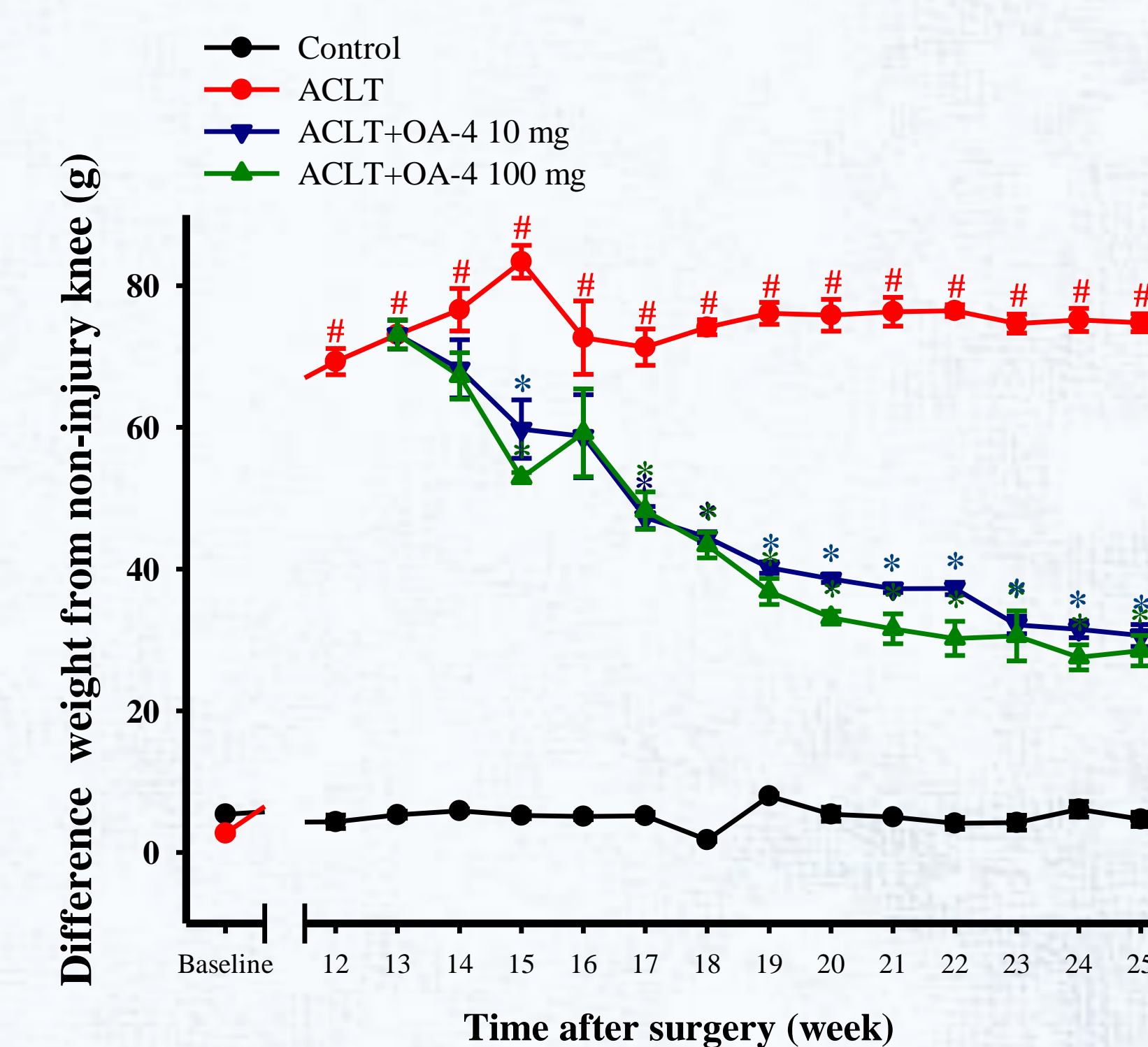
*<0.05, control group compare wit LPS group, #<0.05, LPS group compare wit LPS+OA-4018 group

Figure 3. Effects of s.c. OA-4018 on ACLT-induced OA pain behaviors.

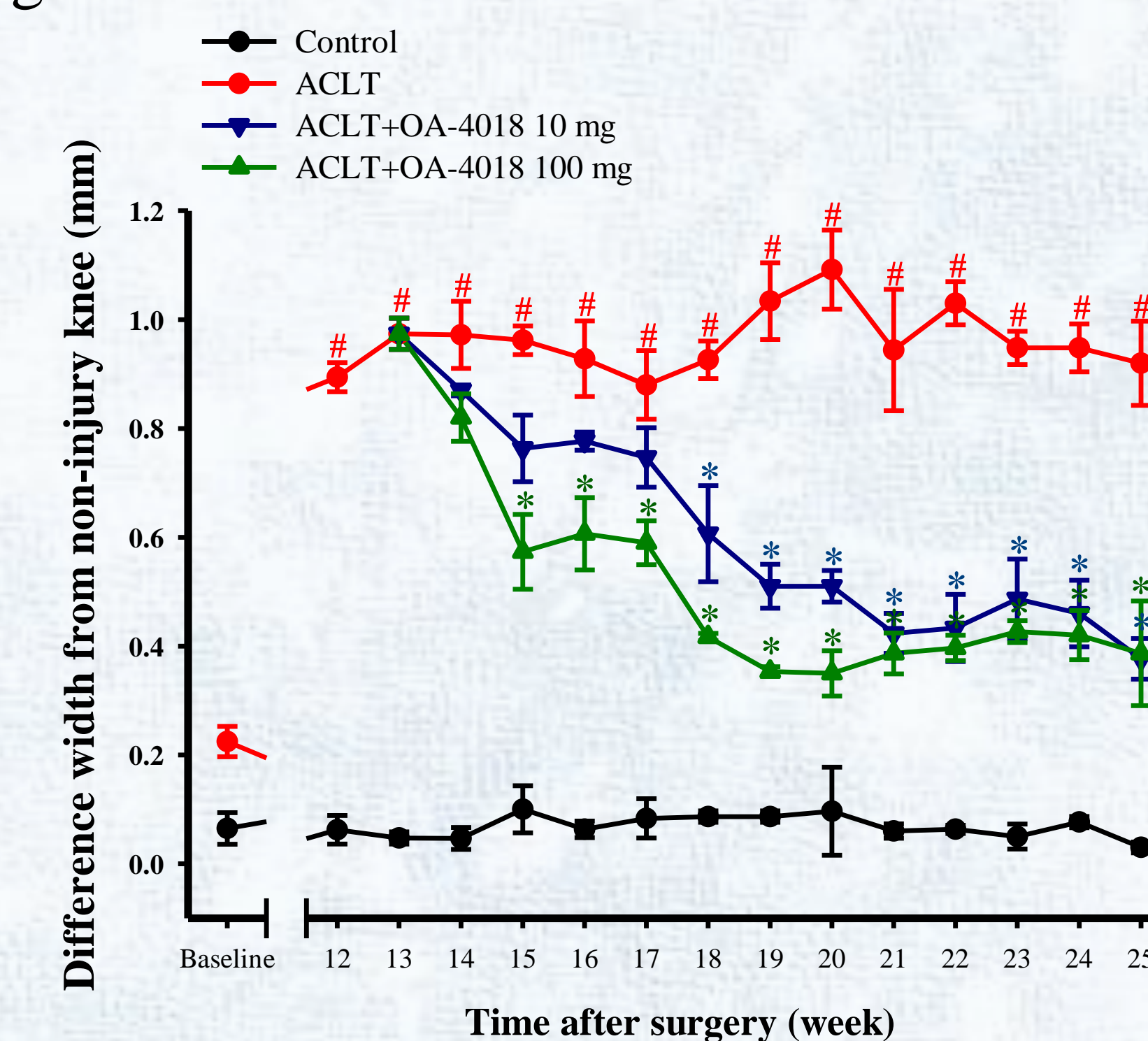
(A) Mechanical allodynia



(B) Weight-bearing

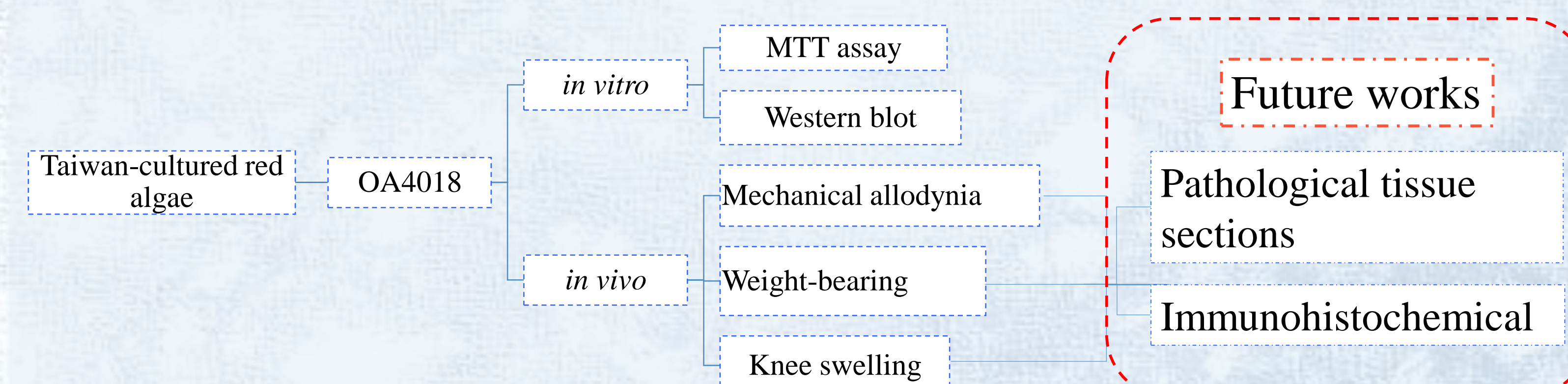


(C) Knee swelling



*<0.05, control group compare wit ACLT group
#<0.05, LPS group compare wit ACLT+OA-4018 group

Summary & Future works



1. OA-4018 did not significantly affect the viability of macrophage cells, and also anti-inflammation.
2. OA-4018 can significant effects on suppressing pain and joint swelling.