

Zinc Protects Articular Chondrocytes through Changes in Nrf2-Mediated Antioxidants, Cytokines and Matrix Metalloproteinases

R e p o r t

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Introduction

□ Osteoarthritis (OA)

□ OA → IL-1 → ECM MMP

□ OA → ROS

□ Nuclear factor erythroid 2-related factor (Nrf2) activates antioxidative capacities to maintain the integrity of cells and provide protection against oxidative stress .

SOD GPx GSH(GCLM+GCLC+HO-1)

Introduction

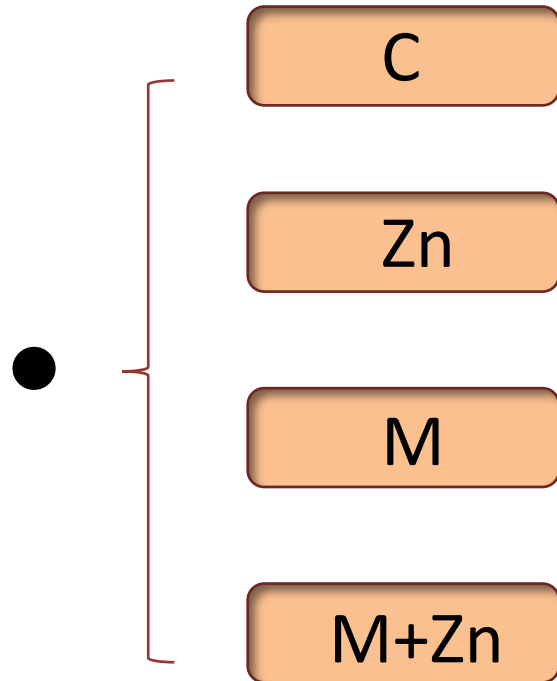
- The trace element zinc (Zn) is a component of more than 300 enzymes and an even greater number of other proteins; hence, this element is essential for human health . Zinc is also involved in oxidative stress, immune responses, homeostasis, apoptosis and aging .

Introduction

- Prasad reported that zinc is an inhibitor of NADPH oxidase, a co-factor of SOD, and an inducer of metallothionein. Additional studies have demonstrated that zinc was relative to chondrocyte's growth, such as zinc at low dose (lower than $0.5 \mu\text{M}$), could increase the proliferation of cultured chondrocytes by 40–50% , and dietary zinc deficiency could inhibit chondrocyte proliferation in the chicken growth plate .

Cell culture experiments: SW1353

- MIA reduced OA chondrocyte



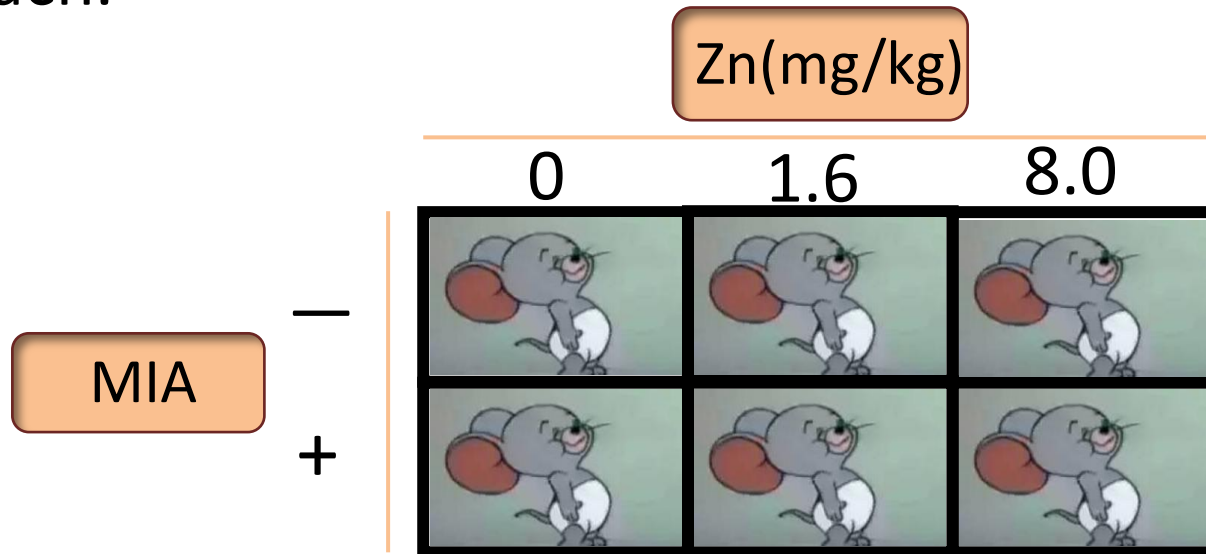
5 μ M MIA and 25 μ M Zn

materials and methods

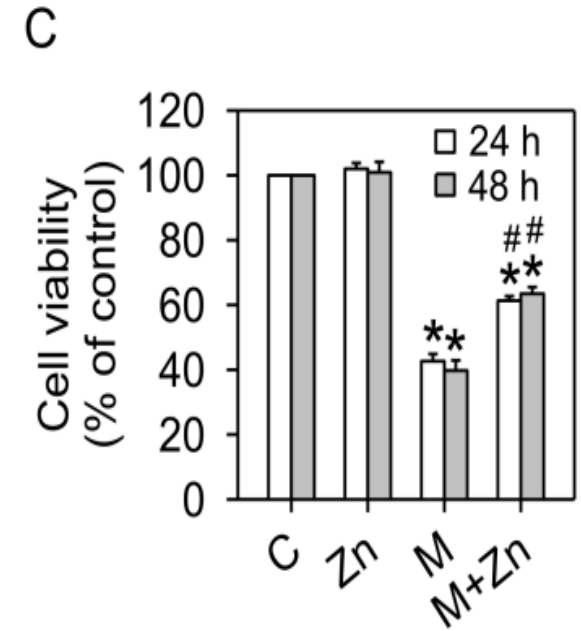
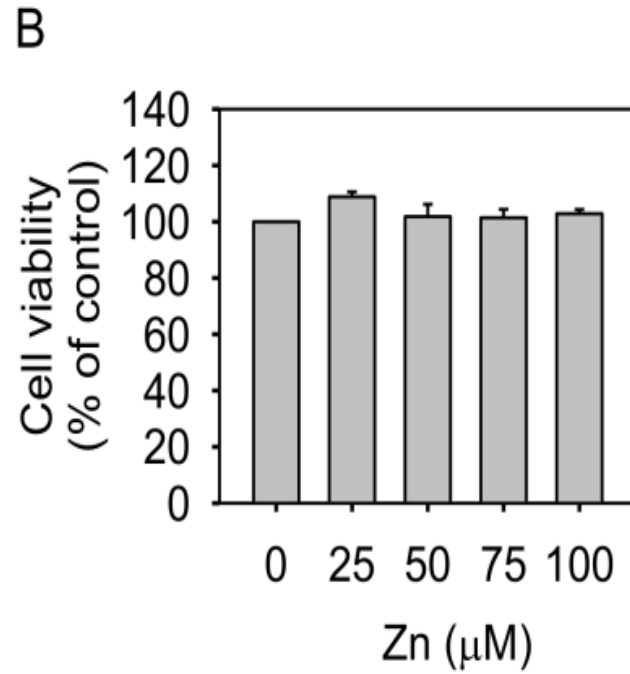
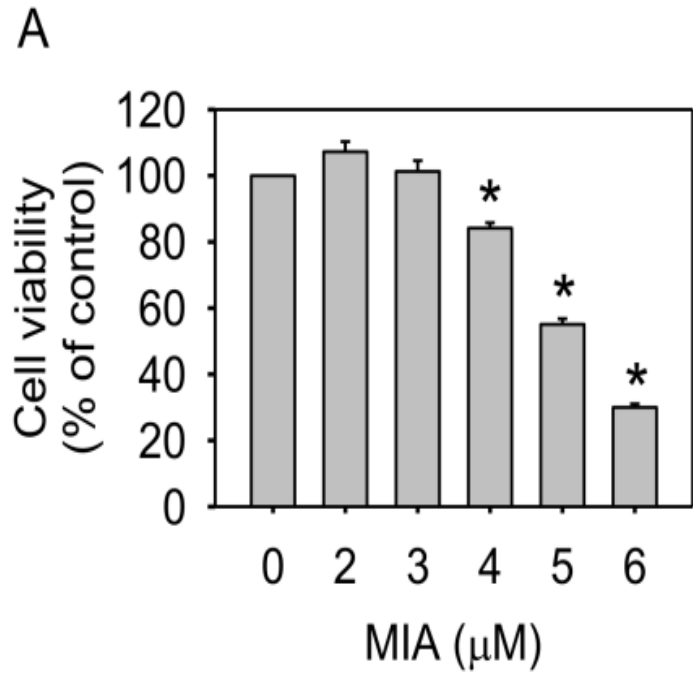
Experimental animals

Wistar rats at 5 weeks of age (150–170 g) were used.

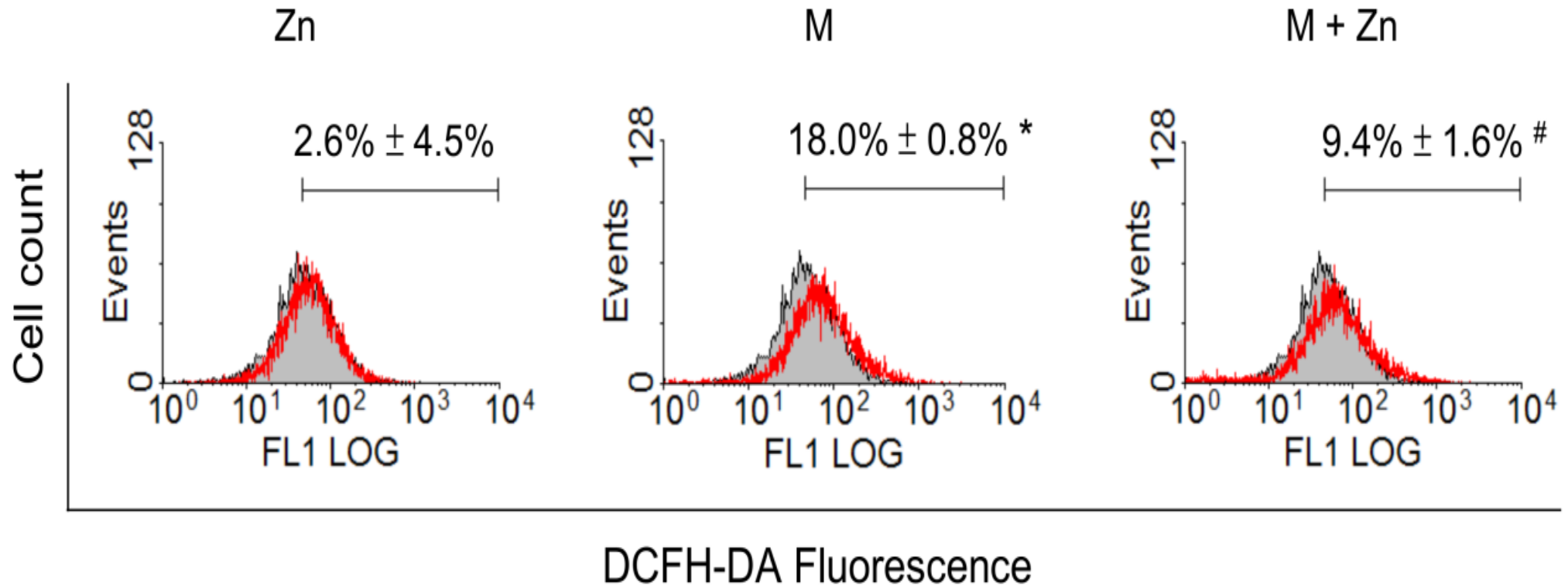
Sixty male Wistar rats were randomly assigned to six groups containing 10 rats each.

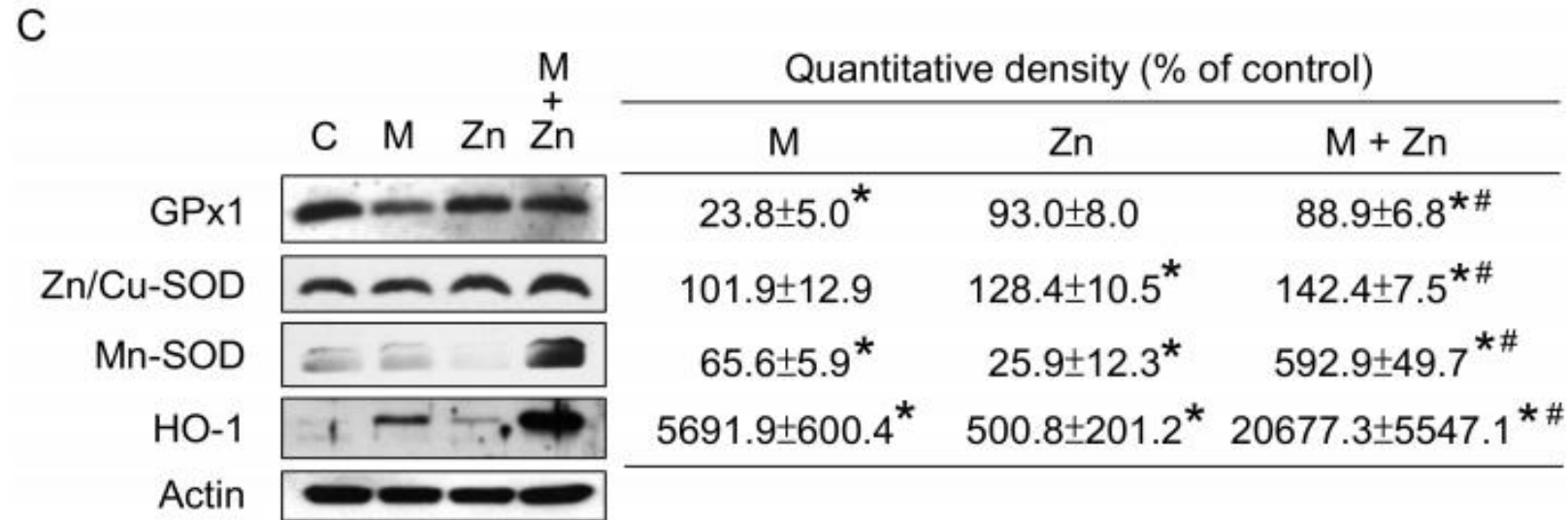
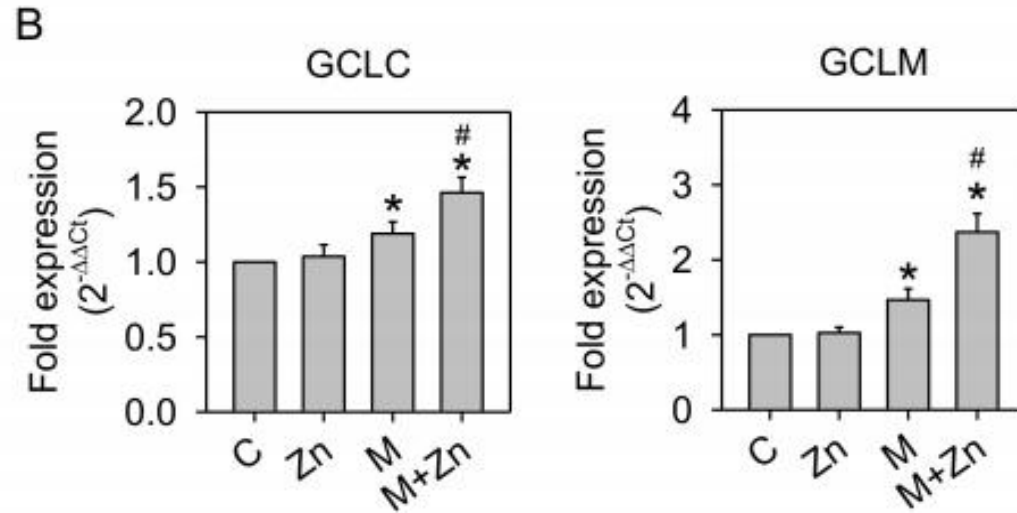
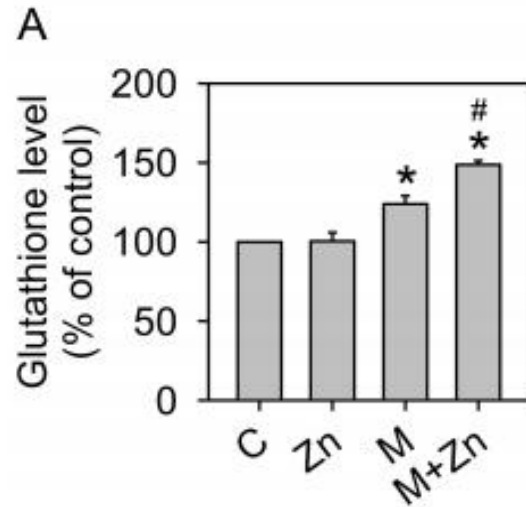


results

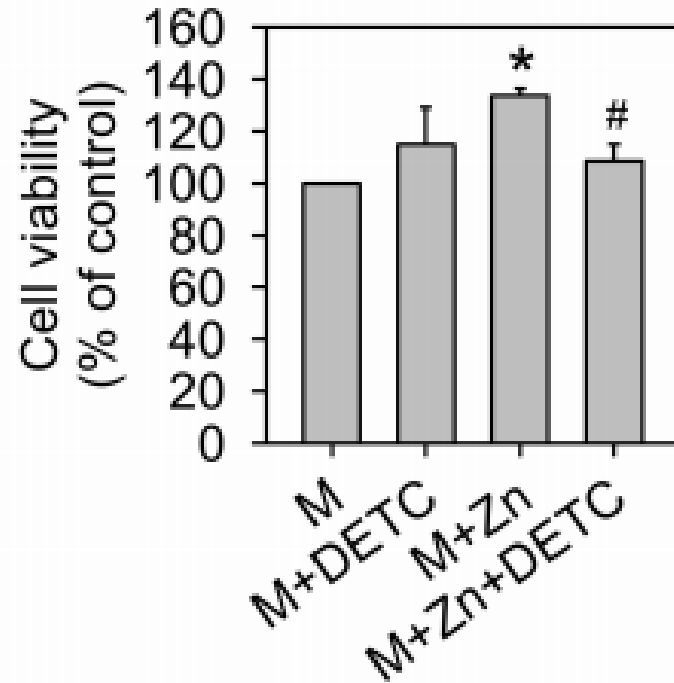
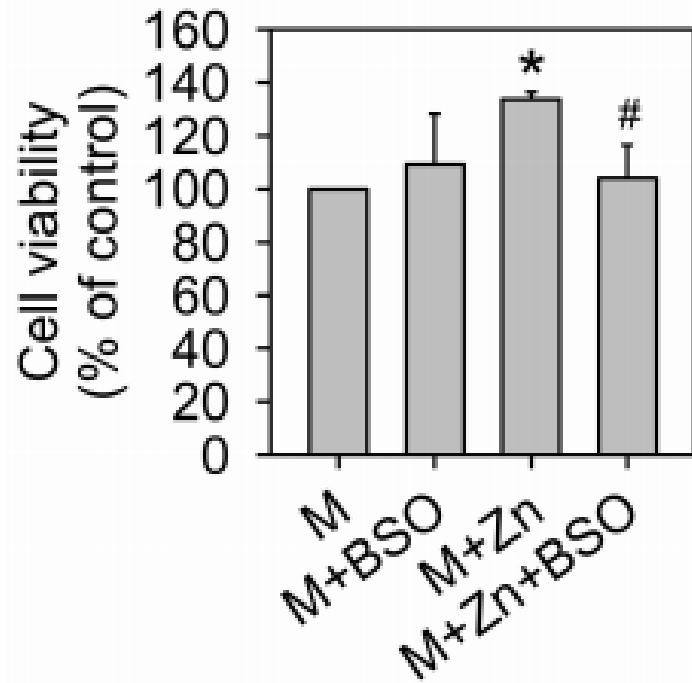


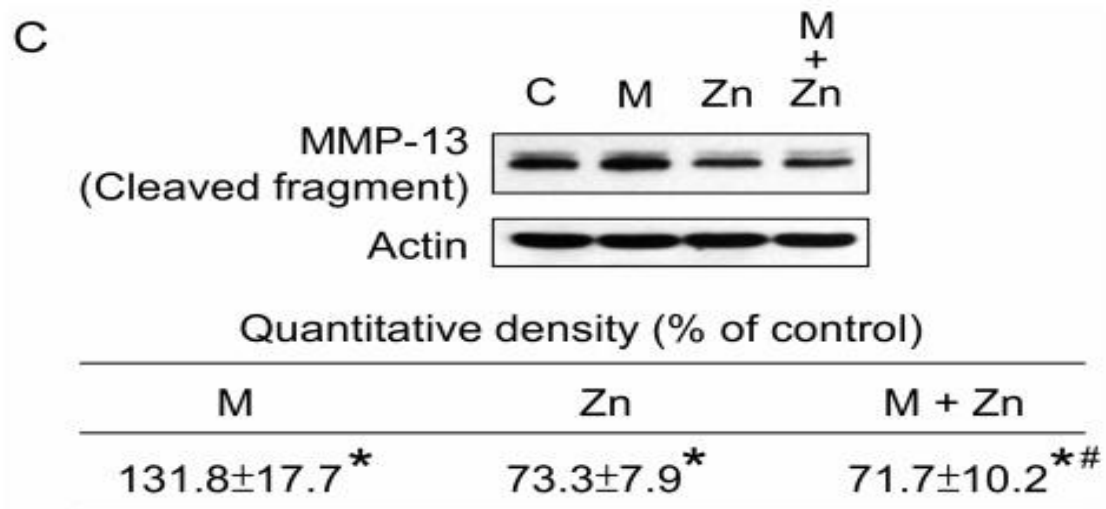
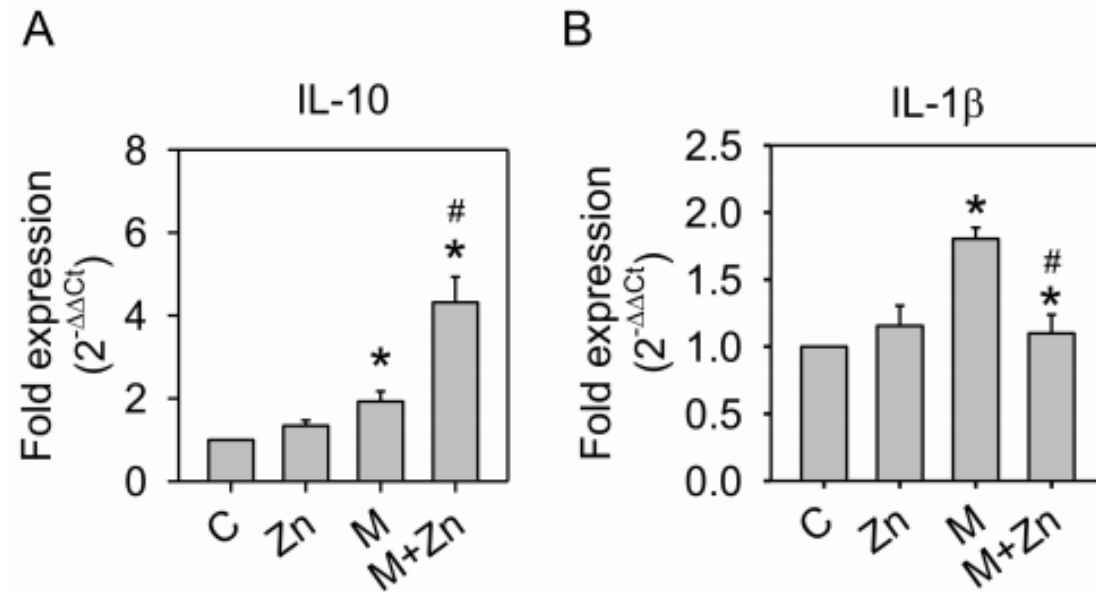
results



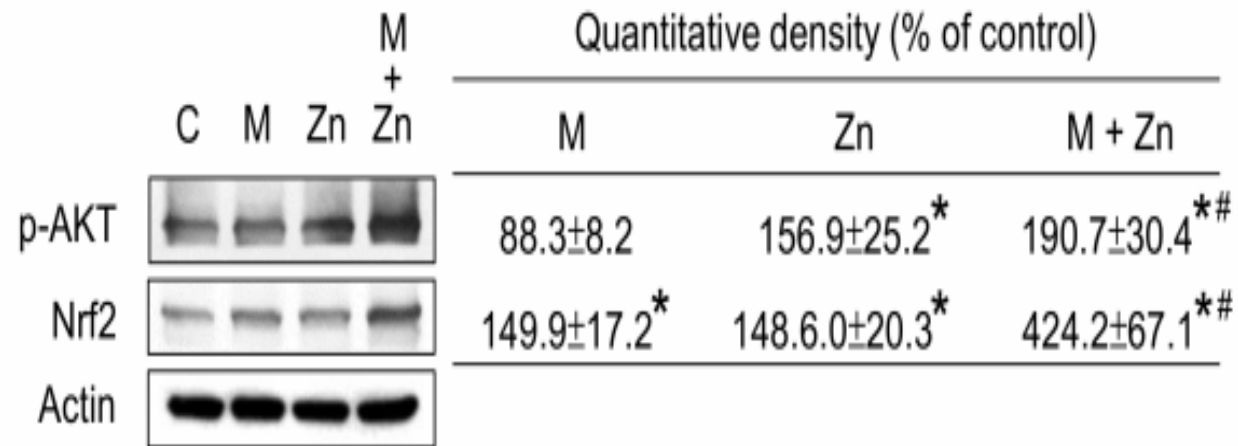


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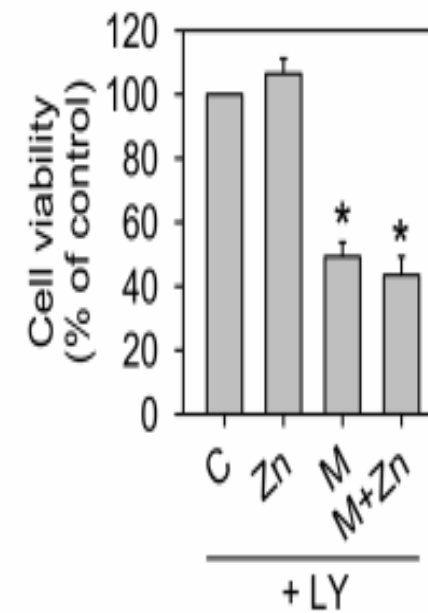




A

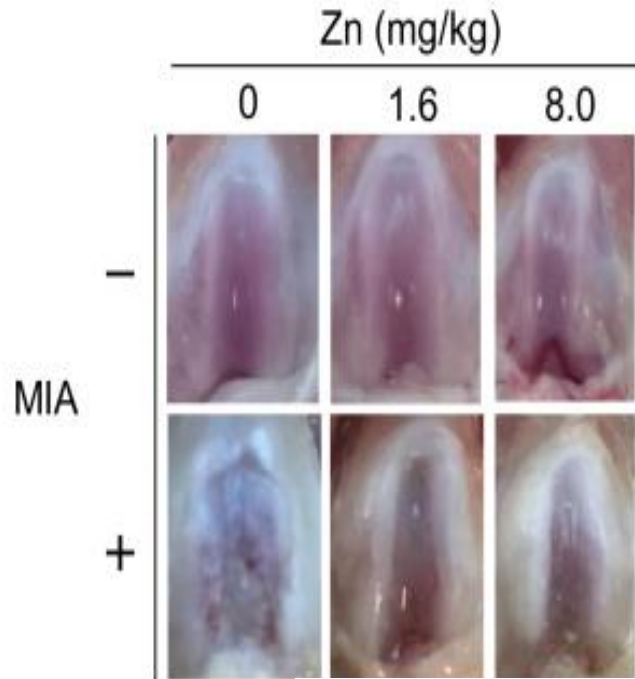


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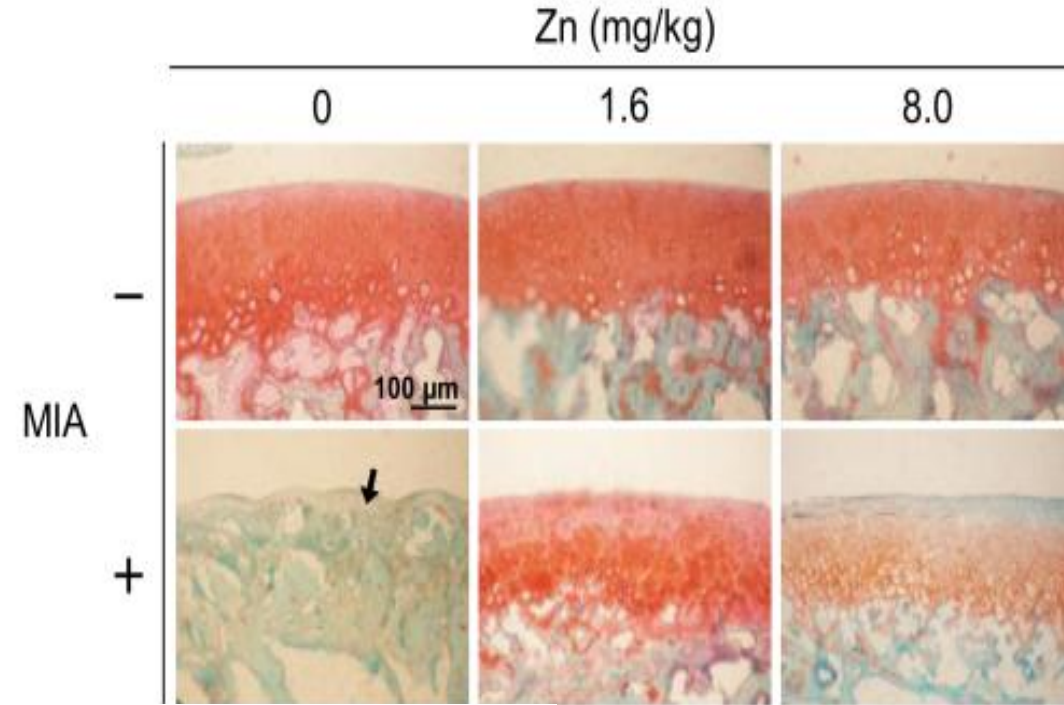


results

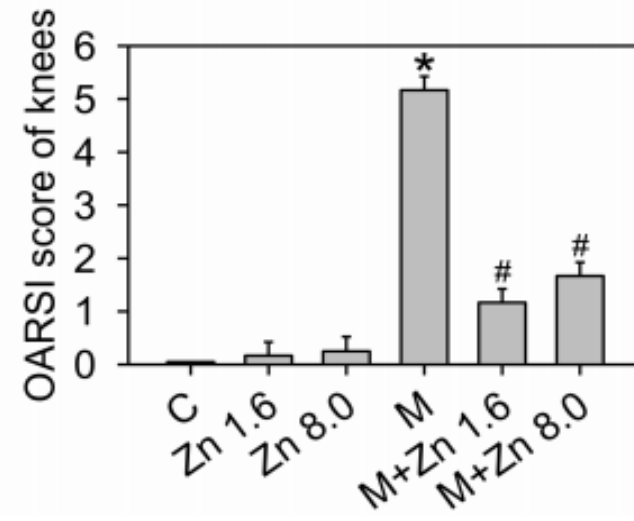
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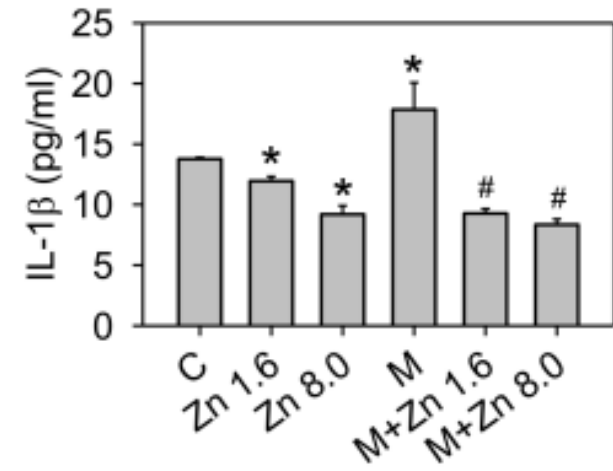
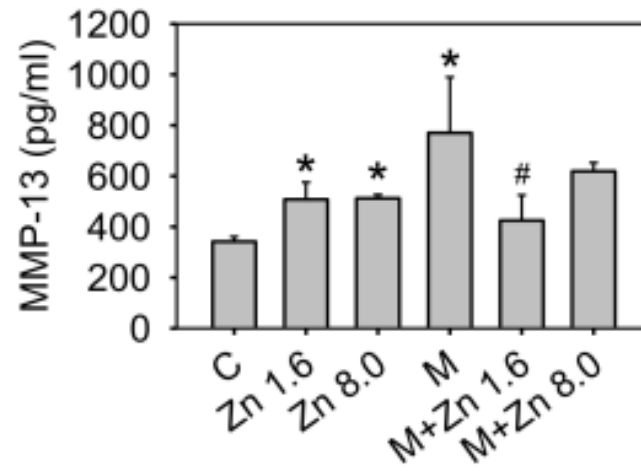
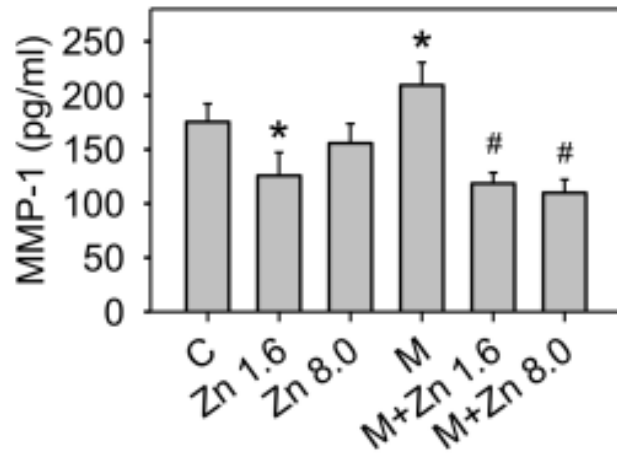
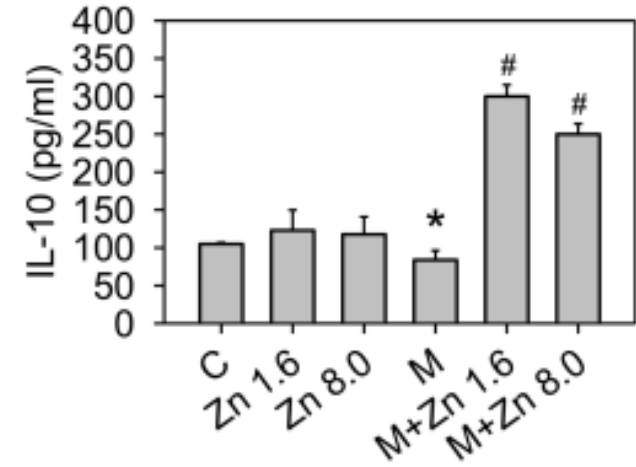
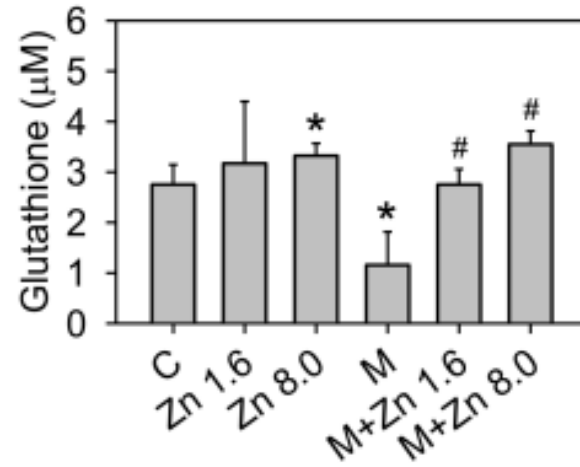
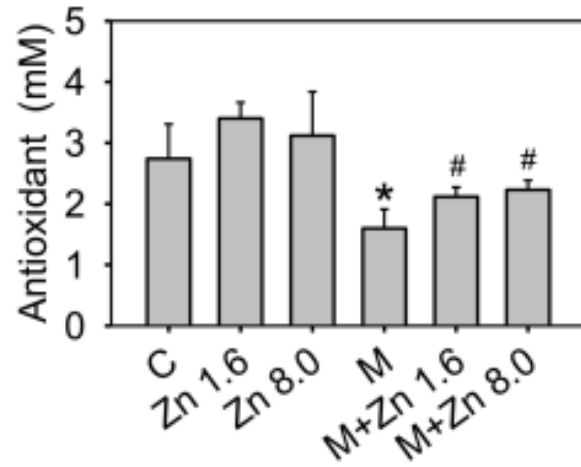
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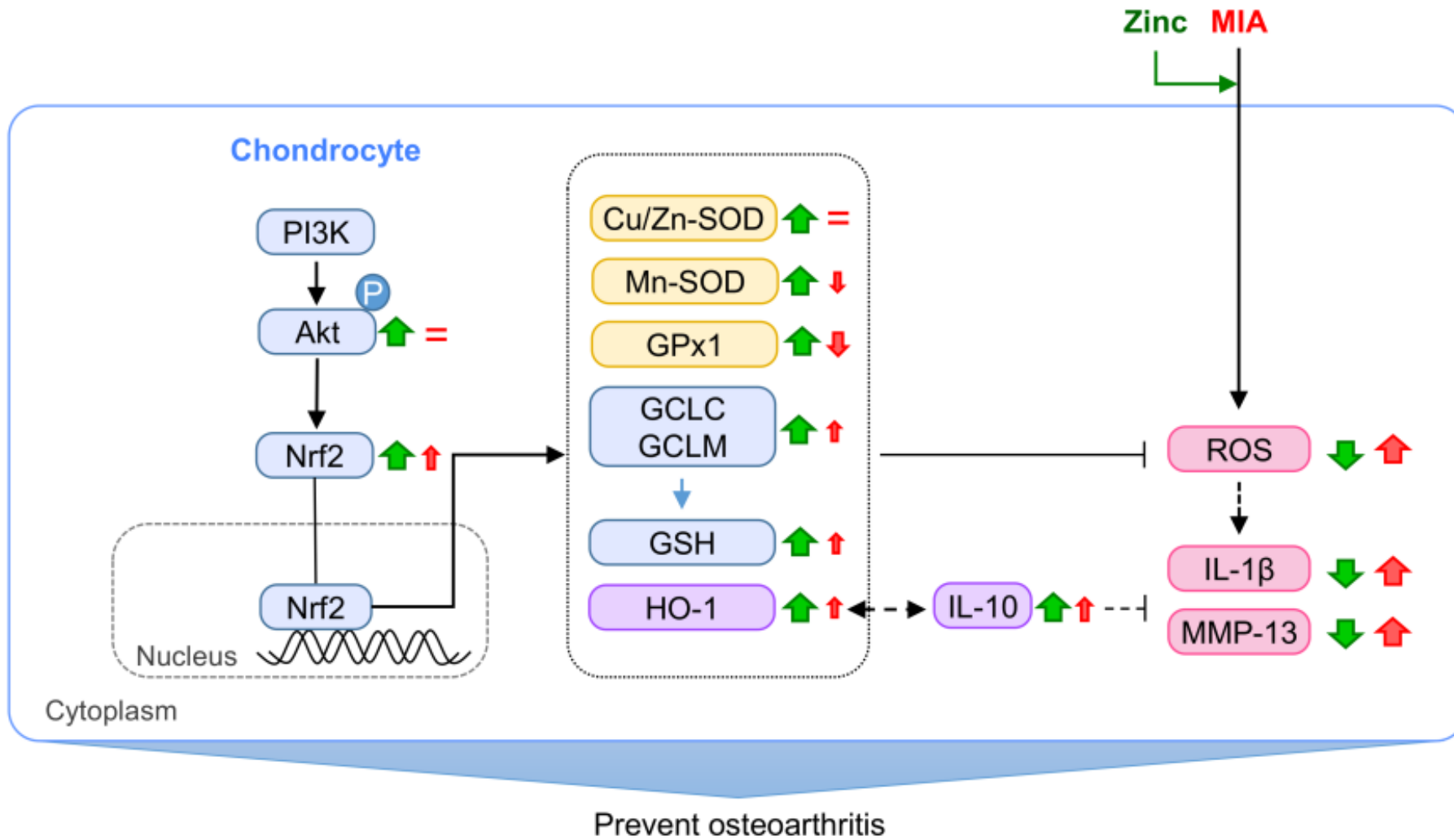
C



results




Discussion



Conclusions

In conclusion, the results of the present study demonstrate, both in vitro and in vivo, zinc can prevent against MIA-induced changes in cartilage degradation similar to human OA. It suggests that zinc has the potential to be a preventive supplement for OA in humans.



谢谢观看

THANK YOU!
