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## Alpha-lipoic acid produces bone-protective effects via modulating Nox<sub>4</sub>/ROS/NF-κB and Wnt/Lrp5/β-catenin signaling pathways in H<sub>2</sub>O<sub>2</sub>-treated MC3T3-E1 cells and ovariectomy rats

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Recently, increasing studies indicated the relationship between oxidative stress and osteoporosis. And some studies have been done to detect the possible beneficial effects of Alpha-lipoic acid (ALA), a potent antioxidant, on osteoporosis *in vivo* and *in vitro*. However, the detailed mechanism(s) underlying the bone-protective action of ALA are still poorly understood. The present study aims to examine the mechanisms by which ALA produces bone-protective effects *in vitro* and *in vivo* on the base of its antioxidant effects, thus the effects of ALA on H<sub>2</sub>O<sub>2</sub>-treated MC3T3-E1 pre-osteoblasts and ovariectomized osteoporosis rat model were investigated by using bone biomechanical testing, microcomputed tomography, western blotting and qRT-PCR analysis. The results showed that ALA promoted osteoblastic formation, inhibited osteoblastic apoptosis, increased OPG/RANKL ratio and enhanced bone formation *in vitro* and prevented bone loss *in vivo*. And the effects of ALA were via modulating Nox<sub>4</sub>/ROS/NF-κB and Wnt/Lrp5/β-catenin signaling pathways, which revealed possible mechanisms of bone-protective effects of ALA. The current study indicated that ALA might be a candidate for the prevention and therapy of osteoporosis clinically at the end of advanced studies.

### Biography

Huijun Sun is the Professor of Pharmacology of Dalian Medical University, China. Her major is pharmacology of metabolic diseases, such as hyperlipidemia, atherosclerosis and osteoporosis and she has published more than 50 papers in reputed journals. She completed her PhD in Dalian Medical University, China and have ever studied and worked in the University of Tsukuba, University of Yamanashi of Japan.

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