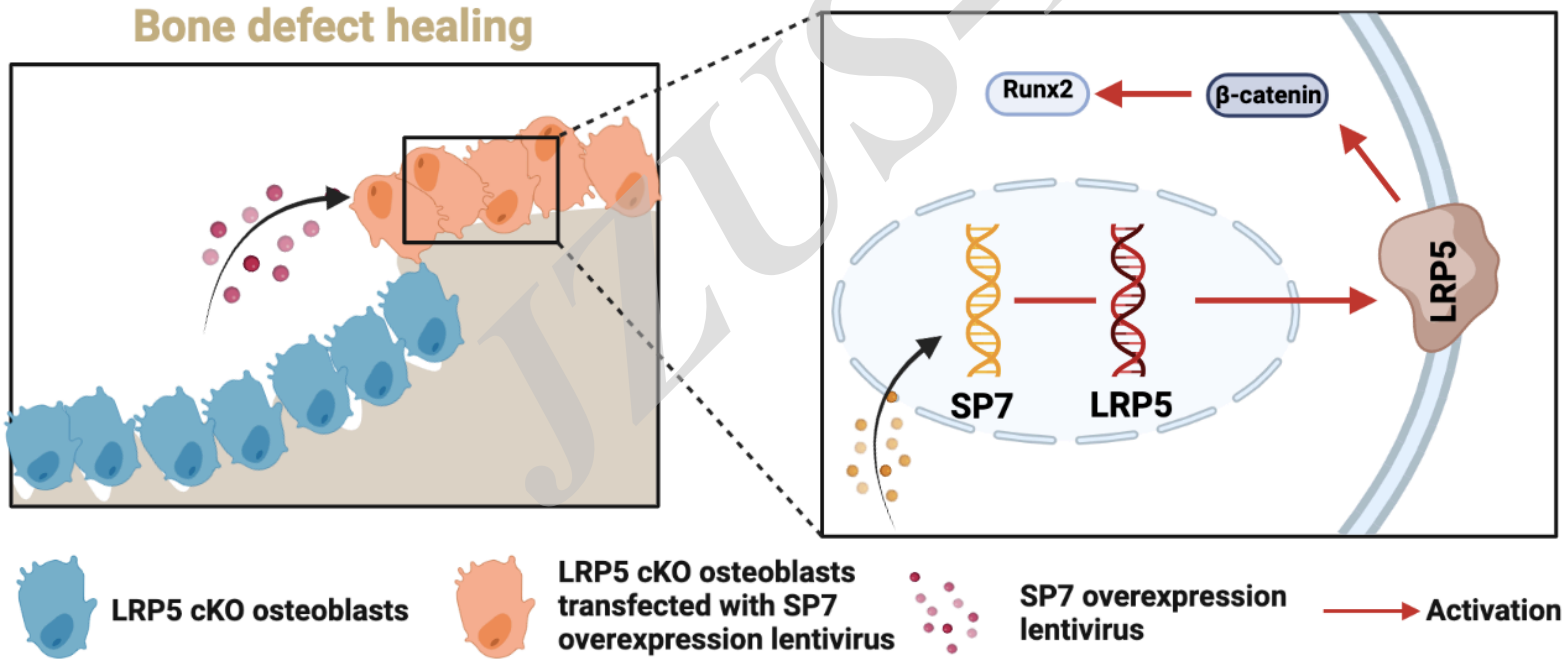
Cite this as: Yue XI, Qifeng JIANG, Wei DAI, Chaozhen CHEN, Yang WANG, Xiaoyan MIAO, Kaichen LAI, Zhiwei JIANG, Guoli YANG, Ying WANG. 2025. SP7 transcription factor ameliorates bone defect healing in low-density lipoprotein receptor-related protein 5 (LRP5)-dependent osteoporosis mice. *J Zhejiang Univ-Sci B (Biomed & Biotechnol)*, 26(3):254-268. http://doi.org/10.1631/jzus.B2300531

SP7 transcription factor ameliorates bone defect healing in low-density lipoprotein receptor-related protein 5 (LRP5)-dependent osteoporosis mice

Key words: Gene therapy; Low-density lipoprotein receptor-related protein 5 (LRP5); Transcription factor osterix (SP7); Osteoporosis; Defect healing

Research Summary

This study aimed to verify whether SP7 could regulate LRP5 expression *in vitro* and to investigate the potential role of SP7 in ameliorating bone defect healing in LRP5-dependent osteoporosis. Our findings provide novel insights into SP7 as a therapeutic target for osteoporosis treatment.



Innovation points

- SP7 could promote LRP5 gene expression, thereby upregulating the osteogenic transcriptional network.

- SP7 enhanced the bone defect healing process by upregulating insufficient LRP5 expression, and the physical and functional interaction between LRP5 and SP7 was confirmed.

- SP7-mediated LRP5 activation could serve as a foundation for the development of therapeutic strategies aimed at improving conditions related to osteoporosis and facilitating bone repair.

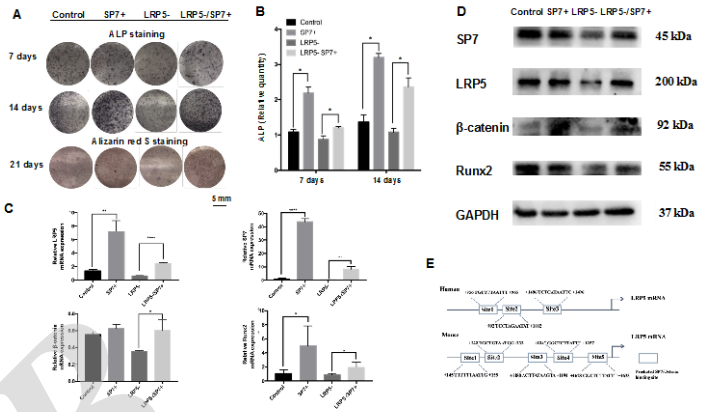


Figure 5

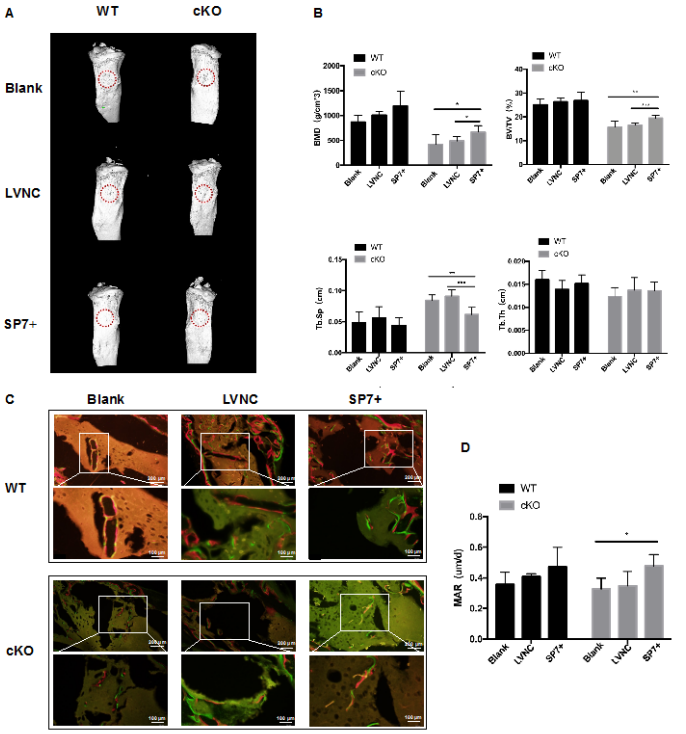


Figure 6