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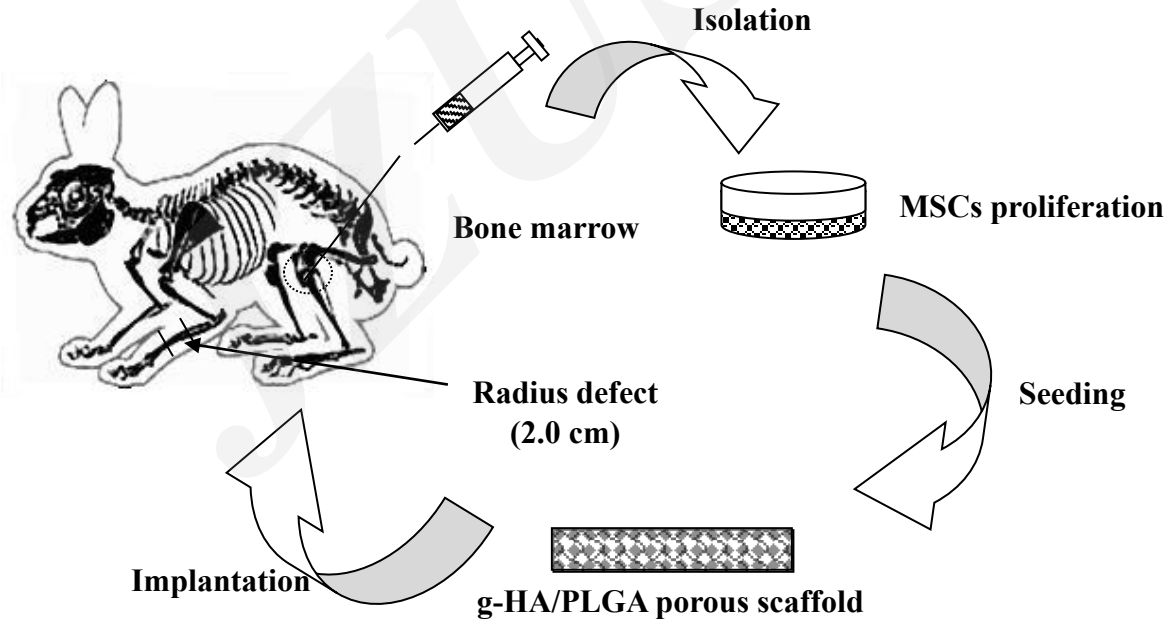
Tissue-engineered composite scaffold of poly(lactide-co-glycolide) and hydroxyapatite nanoparticles seeded with autologous mesenchymal stem cells for bone regeneration

Key words: **Nanocomposite, Surface modification, Bone marrow mesenchymal stem cells, Biomineralization, Bone repair**

Research Summary

In our previous work, we reported a novel composite of g-HA/PLLA (or PLGA),which were achieved with a higher level of mechanical properties and stability. Its cell-free scaffolds have been proven to be mineralizable *in vivo* and to possess osteogenic ability. In the present study, a new therapeutic strategy of g-HA/PLGA carried with autologous MSCs and BMP-2 was assessed for the therapy of critical bone defects, and tissue response and the *in vivo* mineralization of tissue engineered implants were investigated .



Innovation points

- The incorporation of g-HA mainly improved mineralization and bone formation compared with PLGA.
- The application of MSCs can enhance bone formation and mineralization in PLGA scaffolds, compared with cell-free scaffolds.
- Furthermore, it can accelerate the absorption of scaffolds, compared with composite scaffolds.