Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B.
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Supplementary materials

1. BMSCs preparation and identification

BMMSCs were obtained from the long bone shafts of the newborn rabbits after the muscles and tissues were trimmed. Bone marrow was flushed and centrifuged on a 1.073 g/ml Percoll density gradient (EPPendorf Ltd., Shanghai., China). Subsequently, the cells were washed with PBS (HYclone Biological Technology, Ltd., USA), seeded into 25-cm^2 cell culture flasks, and cultivated in L-DMEM (Sigma) supplemented with 10% FBS (Sigma) and 20 mg penicillin-streptomycin/ml (Sigma) in a humidified 5% CO_2 atmosphere at 37°C. The medium was changed every 3 days. When the cells became subconfluent, the cells were released from the culture substratum using trypsin/EDTA (0.25% trypsin and 0.02% EDTA) (Sigma). The cell surface molecules, CD44 and CD34, were analyzed on 3 cultures by flow cytometry (FACSCalibur; Becton, Dickinson and Company, Franklin Lakes, NJ, USA).

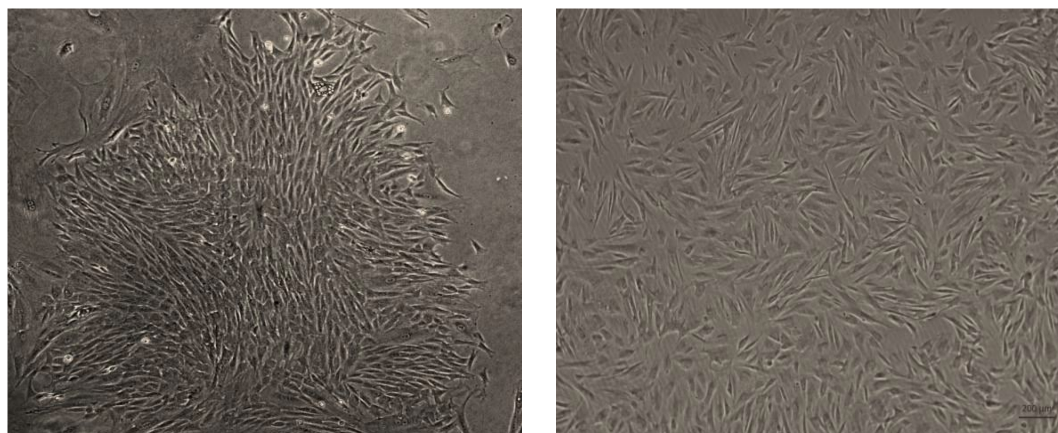

Fig. S1. Primary cell at seventh day (left) and the third passage BMMSCs (right).

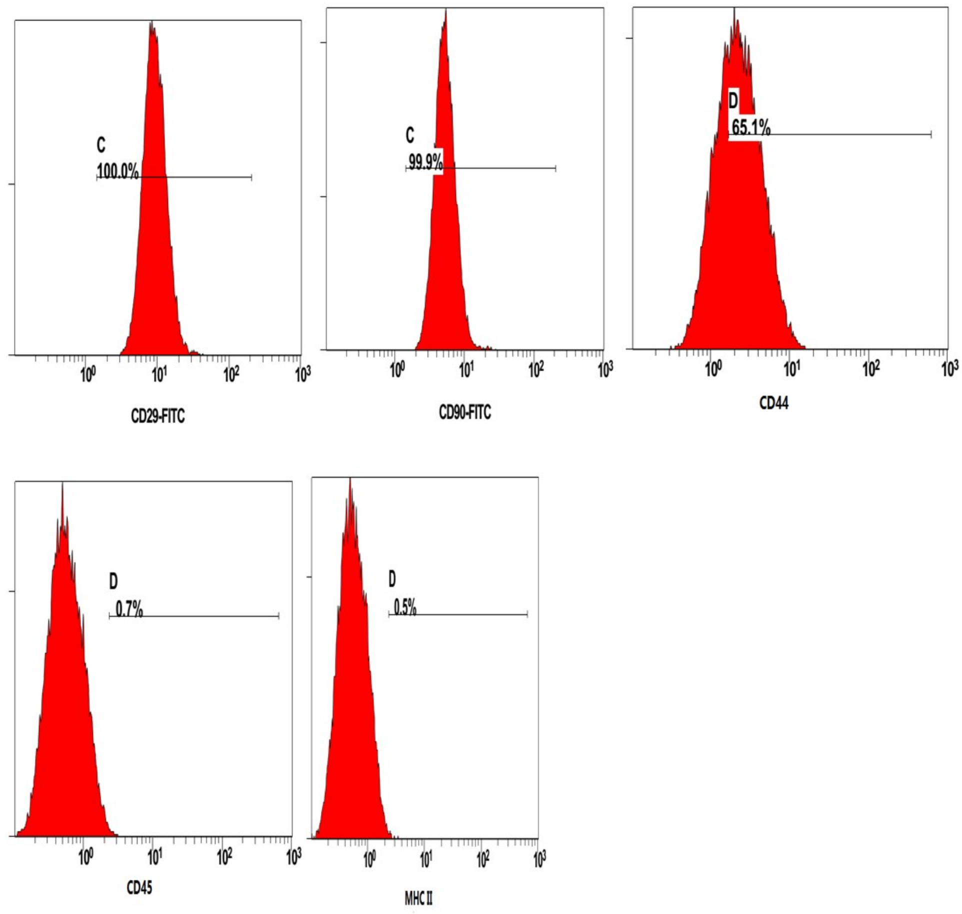

Fig. S2. Identification results of the third passage BMMSCs. BMMSC Surface marker antigen: CD29、CD44 and CD90 were positive. While white blood cell surface marker antigen: CD45 and MHC II were negative.

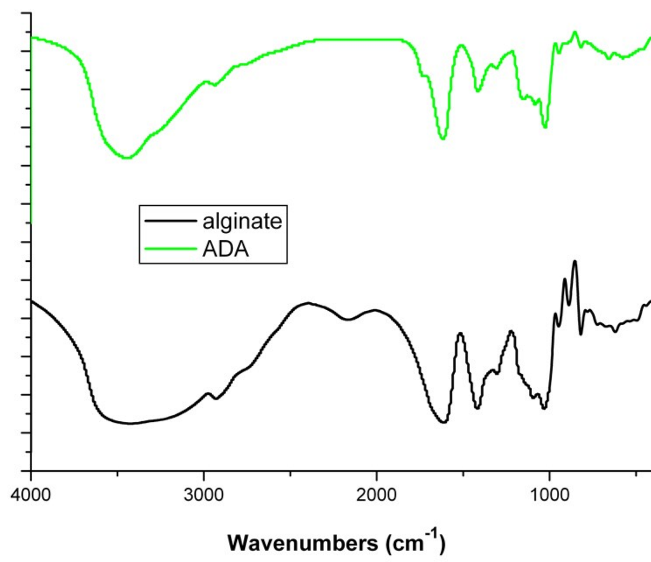

Fig S3. FTIR spectra of the ADA

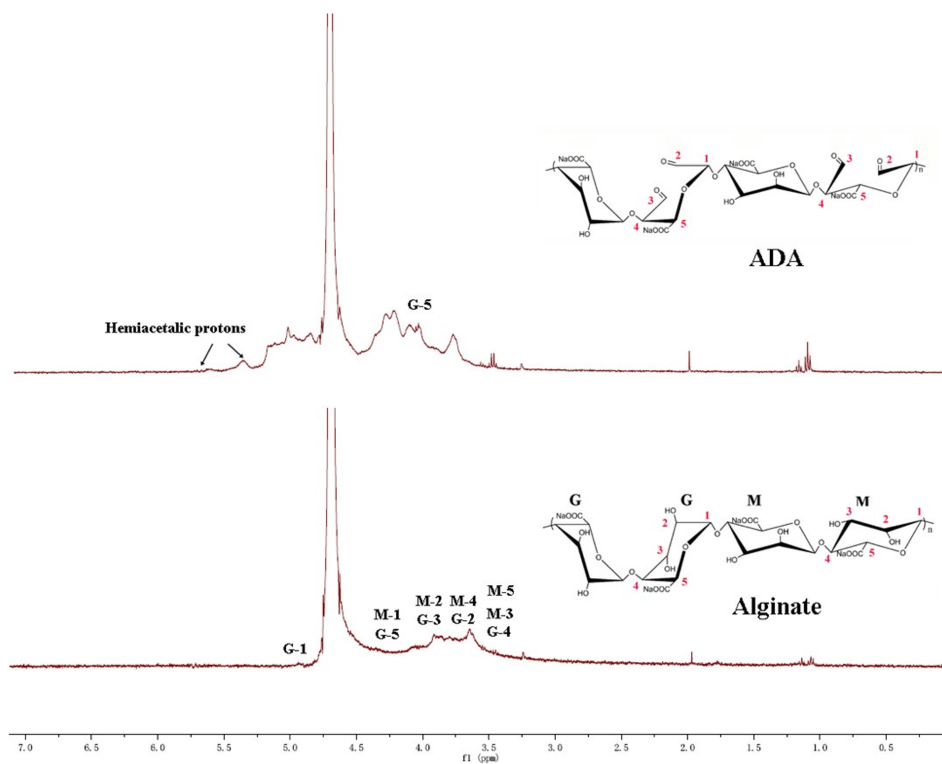

Fig. S4. ^{1}HNMR of the ADA

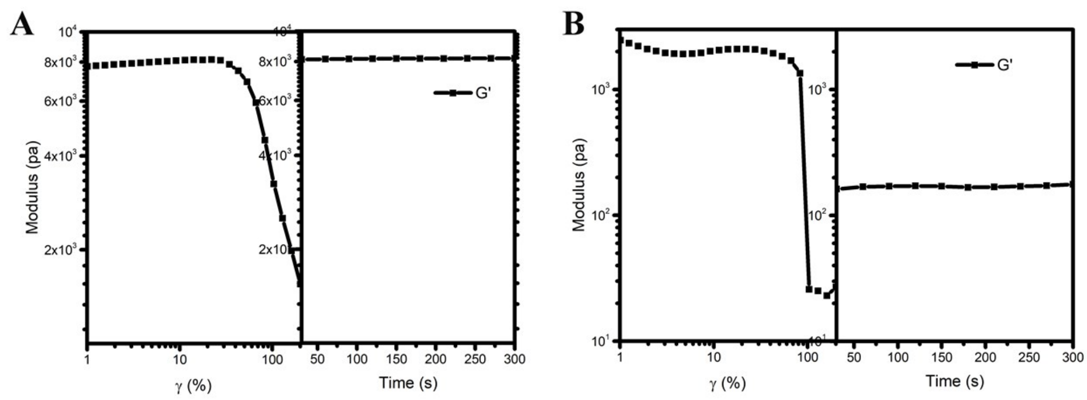

Fig. S5. Dynamic rheological experiments illustrated the self-healing properties of (A) hydrogel and (B) hydrogel without borax.

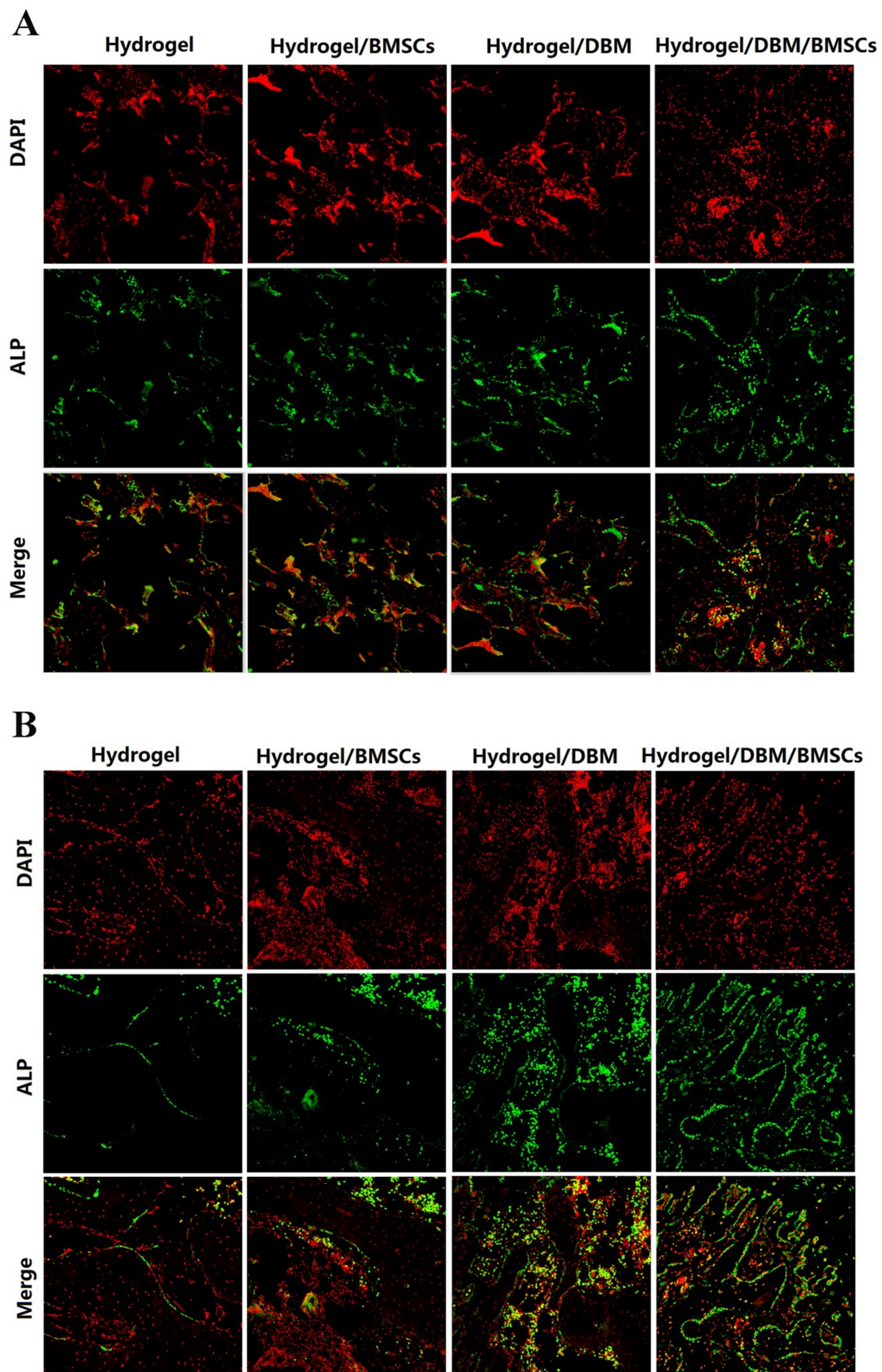

Fig. S6. ALP immunofluorescence staining for different group at 6 weeks (A) and 12 weeks (B) after surgery.

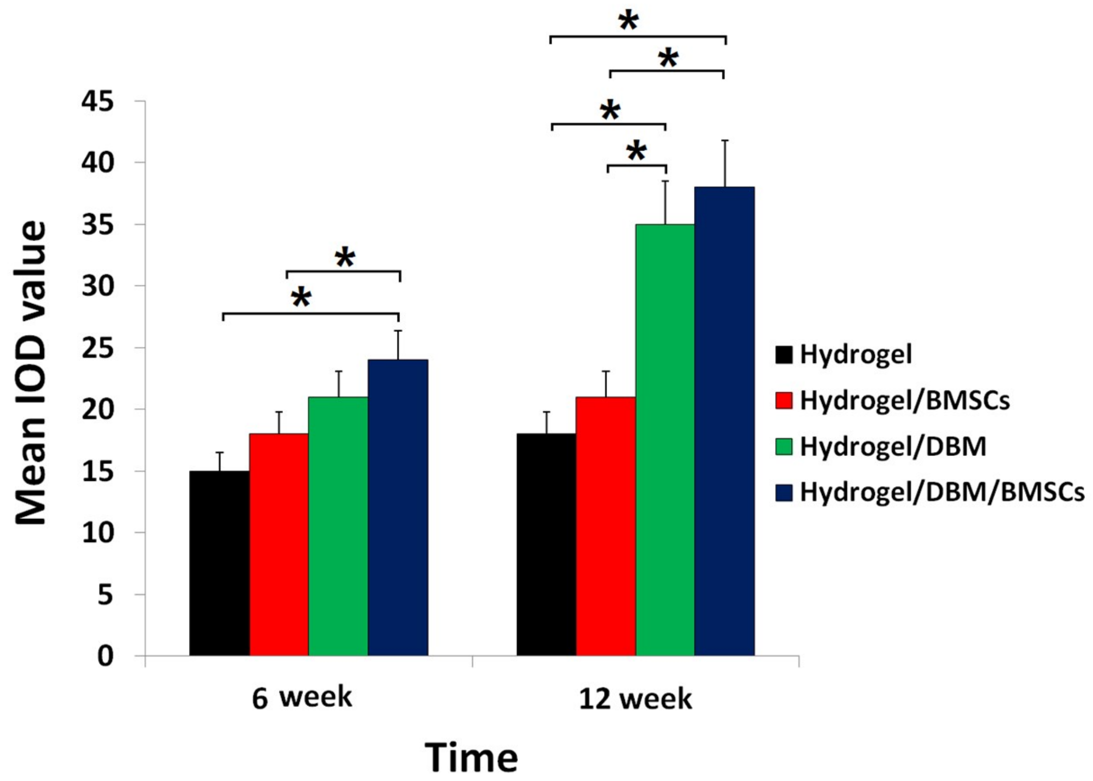

Fig. S7. Quantitatively statistic analysis of ALP immunofluorescence staining for different group at 6 weeks and 12 weeks after surgery (*p < 0.05).