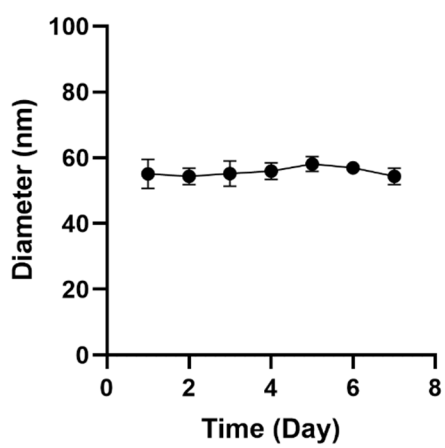
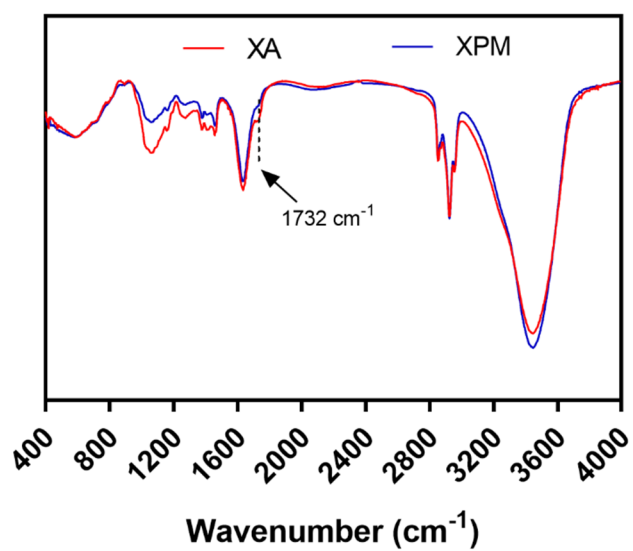


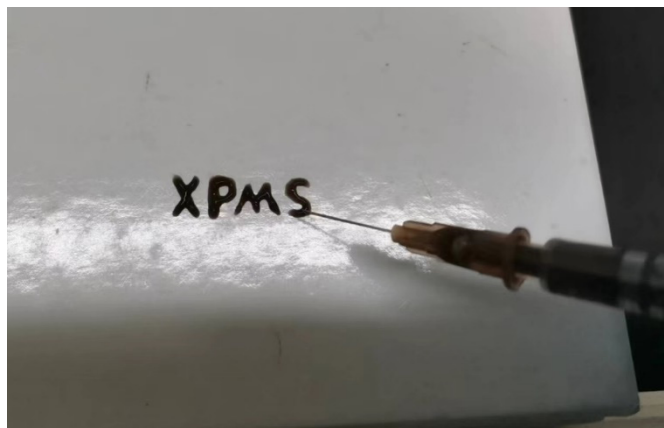
**Figure S1.** Identification of BMSCs in flow cytometry.



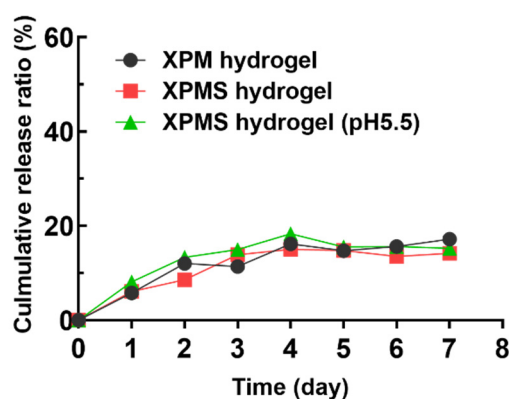
**Figure S2.** Particle size variation of Mg-NPs for 7 days



**Figure S3.** IR spectra of XA and XPM.



**Figure S4.** Injectable properties of XPMS hydrogel



**Figure S5.** Cumulative release ratio of  $Mg^{2+}$  from the XPMS hydrogel under different conditions in vitro.

#### Abbreviations:

SDF-1 $\alpha$ , Stromal derived factor-1 $\alpha$ ; CXCL12, C-X-C Motif Chemokine Ligand 12; CXCR4, C-X-C motif chemokine receptor 4;  $Mg^{2+}$ , Magnesium ions; PDA, polydopamine; Mg-NPs,  $Mg^{2+}$  included nanoparticles; XG, xanthan gum; Xan-CHO, aldehyde xanthan gum; SEM, scanning electronic microscope; TEM, Transmission Electron Microscope; EDS, Energy Dispersive Spectroscopy; BMSCs, bone mesenchymal stem cells; XA, pure xanthan gum; XP, polydopamine modified xanthan gum; XS, SDF-1 $\alpha$  included pure xanthan gum; XPS, SDF-1 $\alpha$  included polydopamine modified xanthan gum; XPM,  $Mg^{2+}$  included polydopamine modified xanthan gum; XPMS, SDF-1 $\alpha$  and  $Mg^{2+}$  included polydopamine modified xanthan gum; ALP, Alkaline phosphatase; ARS, alizarin red staining; BV/TV, bone volume fraction; Tb.N, trabecular number; Tb.Sp, trabecular separation