## **Supporting Information**

## Extracellular matrix (ECM)-inspired high-strength gelatin-alginate based

## hydrogel for bone repair

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Fig. S1 Schematic illustration of HAlg synthesis.



Fig. S2 FTIR spectra of Alg, HAlg, HAlg gel, CDH, Gelatin, and Gelatin-HAlg hydrogel.



Fig. S3 <sup>1</sup>H-NMR ( $D_2O$ , 400 MHz) spectra of HAlg with different hydrazide substitution degrees and HAlg modified by benzaldehyde.



Fig. S4 The pictures of different state and binary diagram for Gelatin-HAlg.



Fig. S5 Preparation process of Gelatin-HAlg hydrogels in region V.



Fig. S6 Photographs of hydrogels after being immersed in PBS at different times.



Fig. S7 (A) Cell viability of MC3T3 cells after being treated with various concentrations of PSO after 4 d and (B) 7 d.