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Electronic Supplementary Information

Sustained Release of Bioactive IGF-1 from a Silk Fibroin Microsphere-Based Injectable Alginate Hydrogel for the Treatment of Myocardial Infarction

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Keywords: Sustained release; Myocardial infarction; IGF-1; Silk fibroin microspheres; Alginate hydrogel

S1. Rheological and Mechanical Properties of Composite Hydrogels

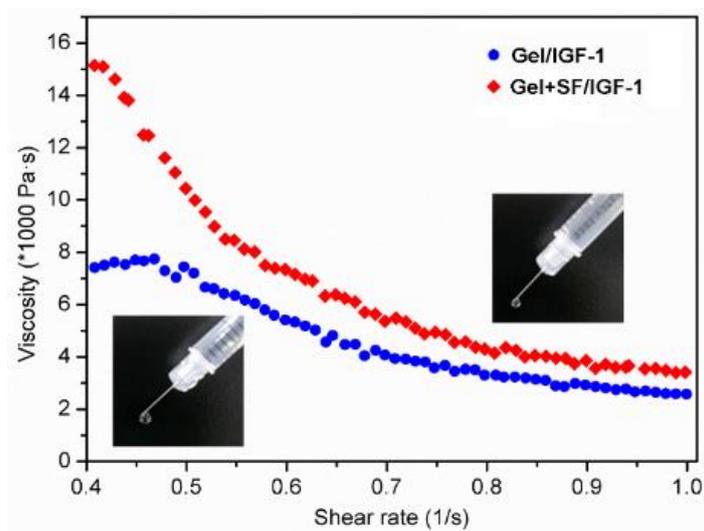


Fig. S1. Viscosity and shear-thinning behavior of Gel/IGF-1 and Gel+SF/IGF-1. The insets show that hydrogels are injectable through a conventional syringe using a 30 G needle.

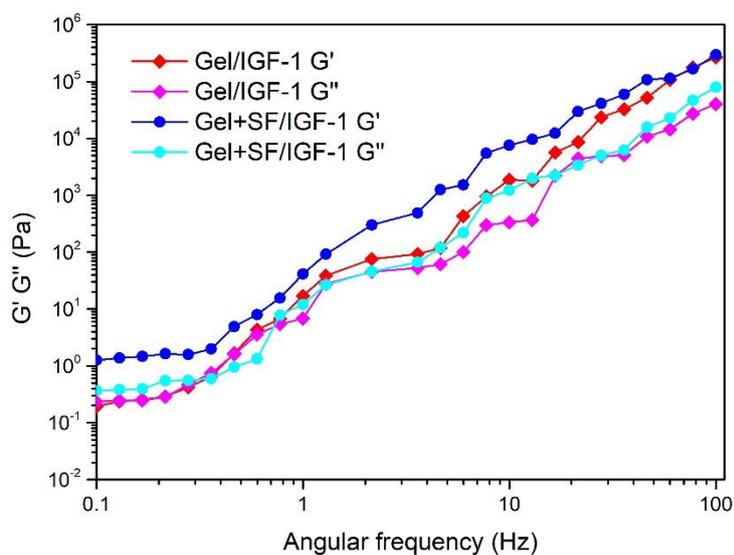


Fig. S2. Frequency dependence of storage modulus (G') and loss modulus (G'') of Gel/IGF-1 and Gel+SF/IGF-1. The volume ratio of sodium alginate to calcium gluconate was 1:1. The G' was greater than G'' for both two gels, indicating gel-like character. The values of G' and G'' increased slightly after incorporation of SF microspheres into hydrogel.

S2. In Vitro Stability of SF Microspheres and Composite Hydrogels

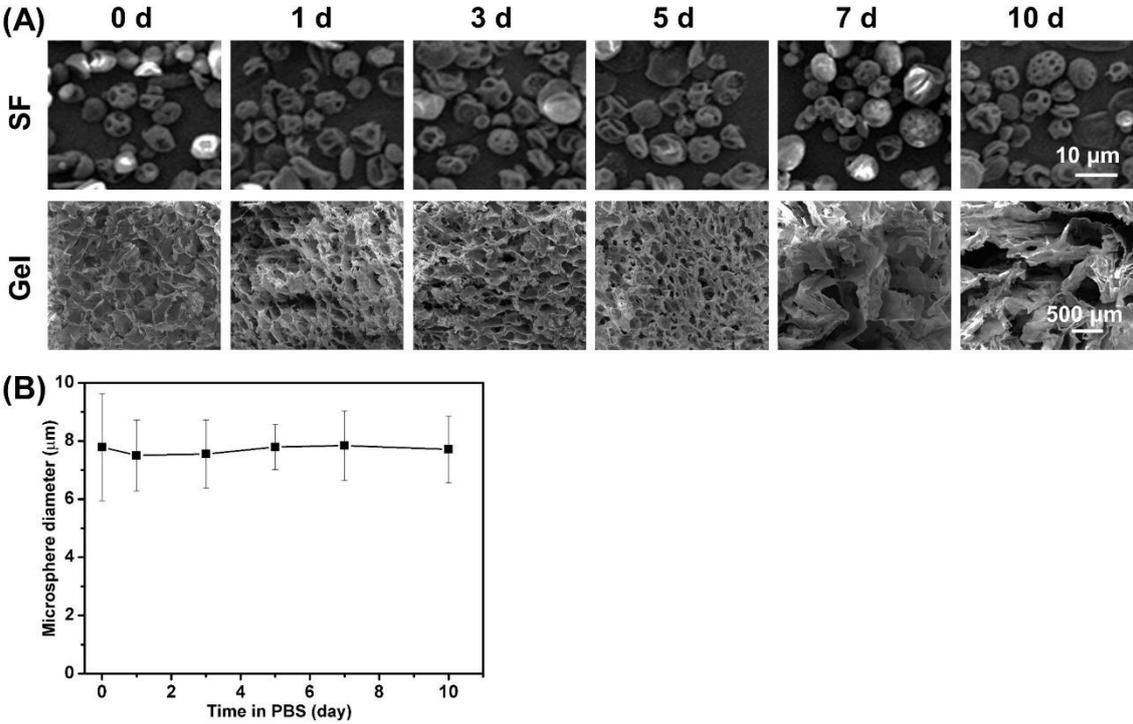


Fig. S3. (A) SEM images of SF microspheres and composite hydrogels after incubation in PBS for up to 10 days. (B) The diameters of SF microspheres after incubation in PBS for up to 10 days.

S3. Function of H9C2 Cells Cultured on Different Composite Hydrogels

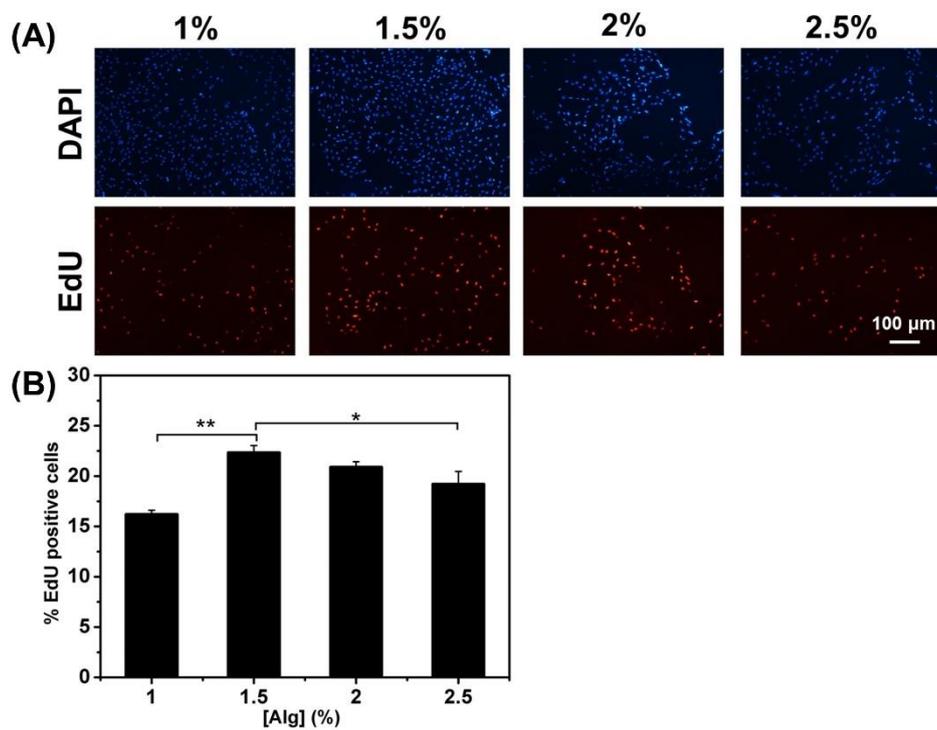


Fig. S4. (A) Attachment and function of H9C2 cells on the surfaces of different Gels with varying [Alg]. The volume ratio of sodium alginate to calcium gluconate was 1:1. (B) Quantitative analysis of EdU-positive H9C2 cells on the surfaces of different Gels. (Note: $*p < 0.05$; $**p < 0.01$).

S5. Evaluation of Acute Inflammatory Response

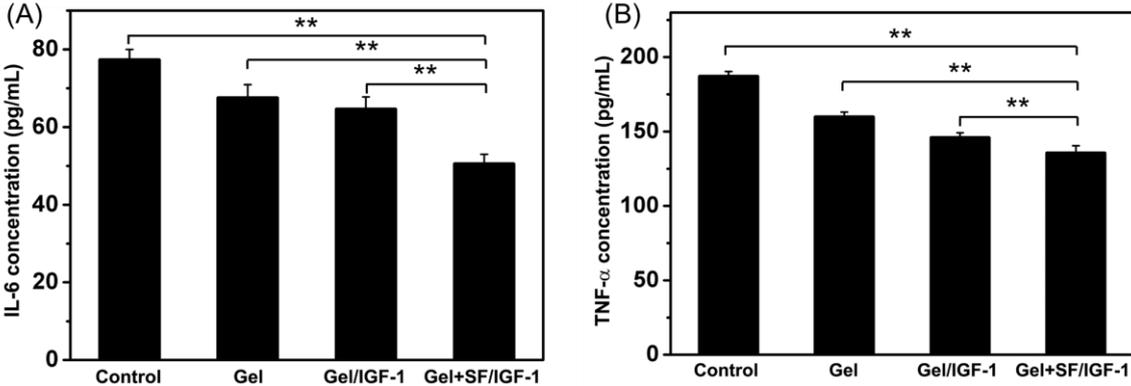


Fig. S5. Concentration of (A) IL-6 and (B) TNF-α after injection of different gels for 7 days.

(Note: ** $p < 0.01$).