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

Supporting Information

Tough and self-healing poly(L-glutamic acid) based composite hydrogel for tissue engineering

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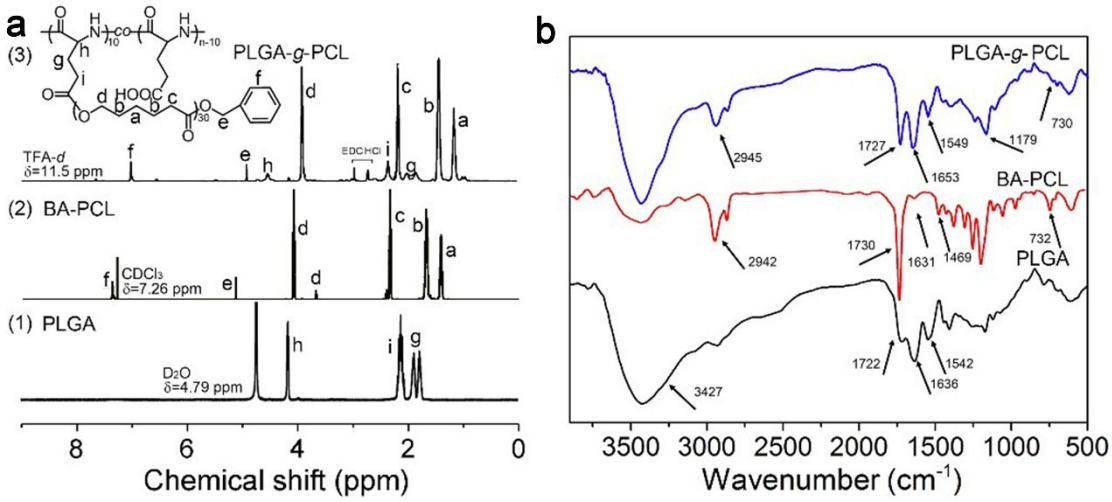

Figure S1. Characterization of PLGA-*g*-PCL. (a) ^{1}H NMR spectra, (b) FTIR spectra.

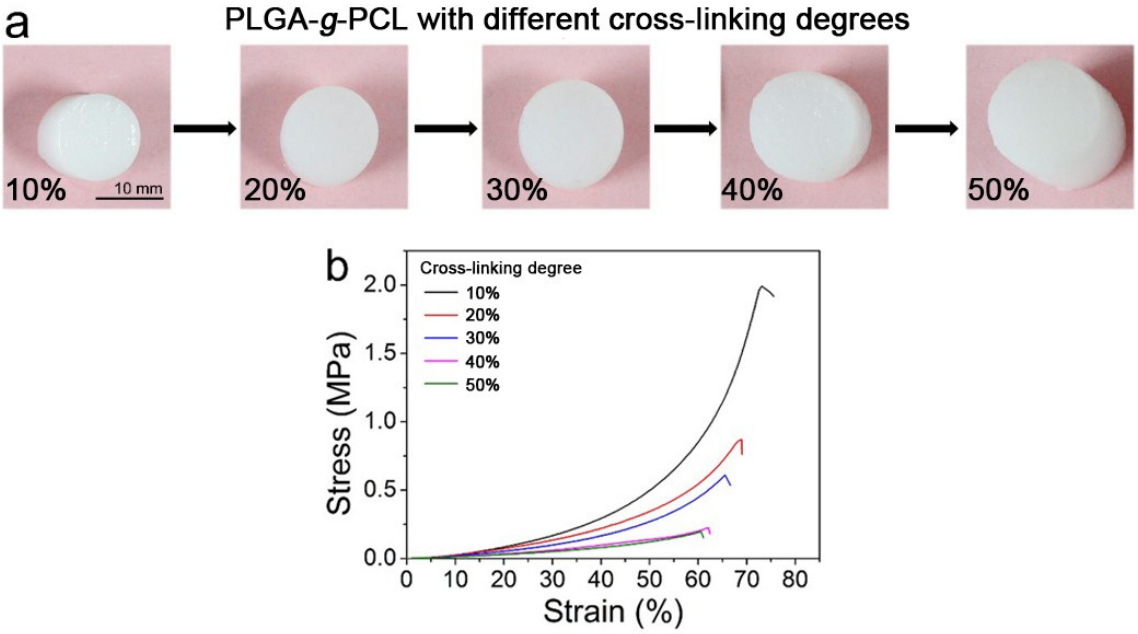

Figure S2. PLGA-*g*-PCL hydrogels with different cross-linking degrees after dialysis in water. (a) Macromorphology. (b) Compression strength. **Response #1.3**

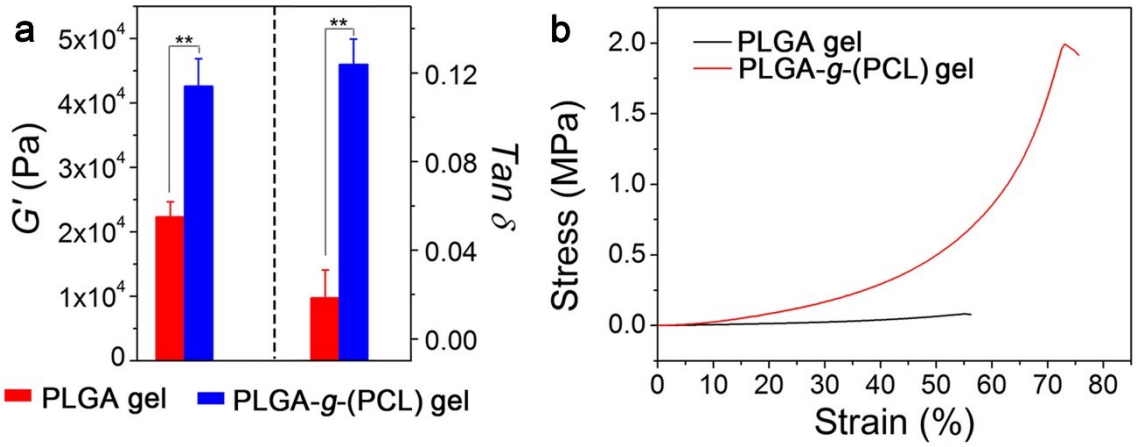

Figure S3. (a) G' and Tanδ, (b) compressive stress-strain curve of the PLGA hydrogel and the PLGA-*g*-PCL hydrogel.

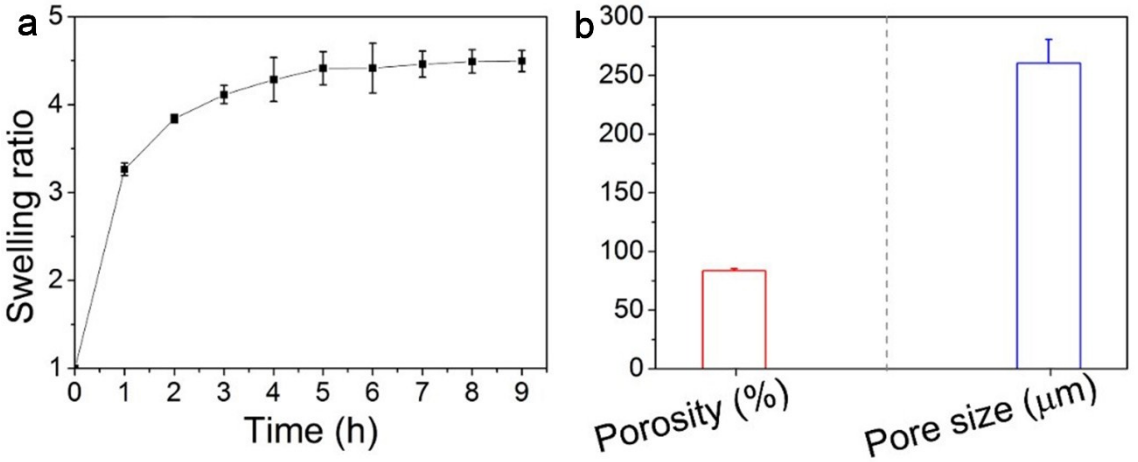

Figure S4. (a) Swelling kinetics, (b) porosity and average pore diameter of the PLGA based tough porous hydrogel skeleton.

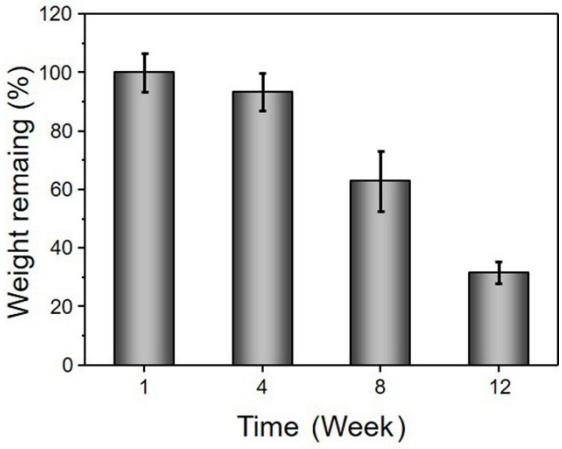

Figure S5. In vivo degradation of the PLGA based tough porous hydrogel skeleton. The data was calculated according to the thickness of the remaining skeleton from H&E staining images.

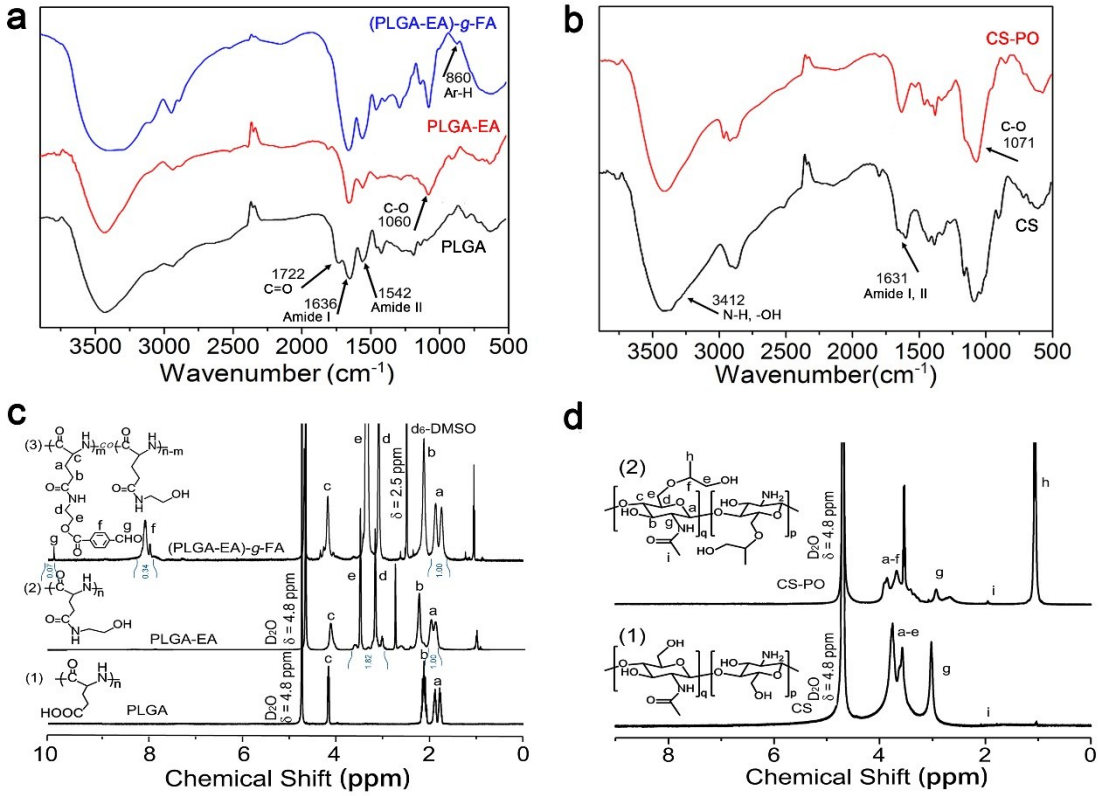

Figure S6. FT-IR spectra of (a) (PLGA-EA)-*g*-FA and (b) CS-PO. ^{1}H NMR spectra of (c) (PLGA-EA)-*g*-FA and (d) CS-PO.

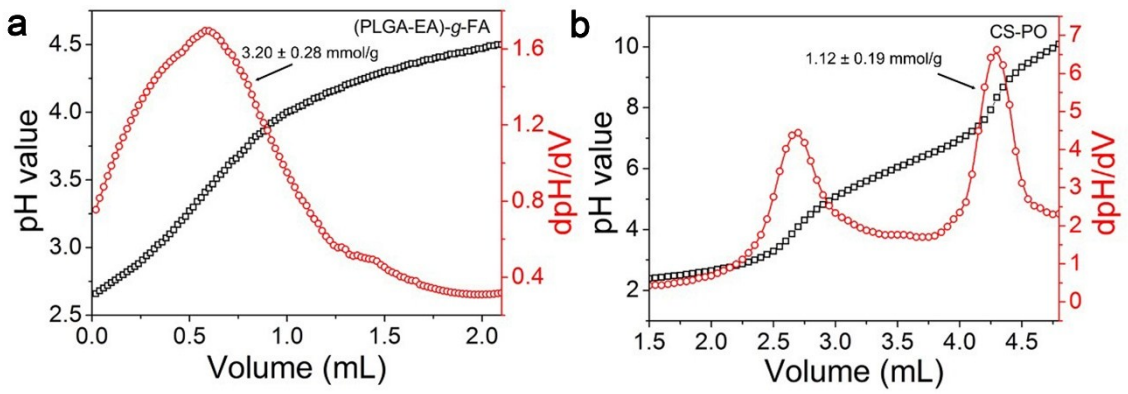

Figure S7. (a) Hydroxylamine hydrochloride titration curve and differential curve of (PLGA−EA)-*g*-FA. (b) Polymer potentiometric titration curve and differential curve of CS−PO.

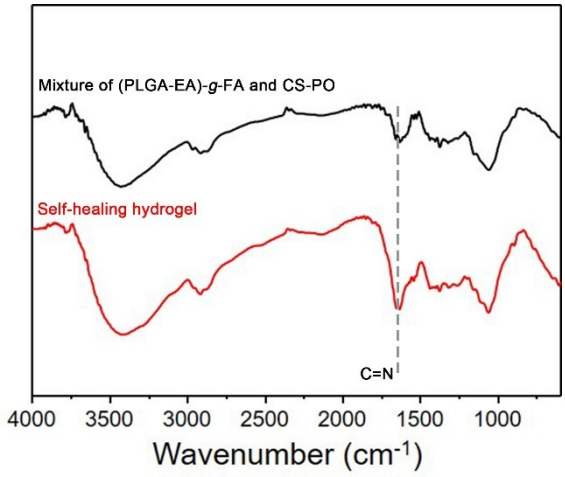

Figure S8. FT-IR spectra of (PLGA-EA)-*g*-FA/CS-PO mixture and self-healing hydrogel.

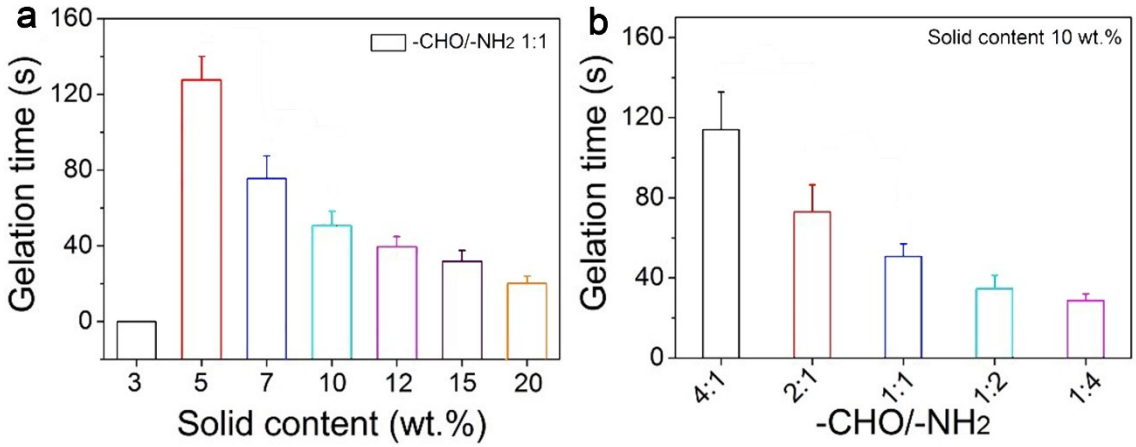

Figure S9. Gelation time of self-healing hydrogel with (a) different solid content and (b) different -CHO/-NH_2 molar ratio.

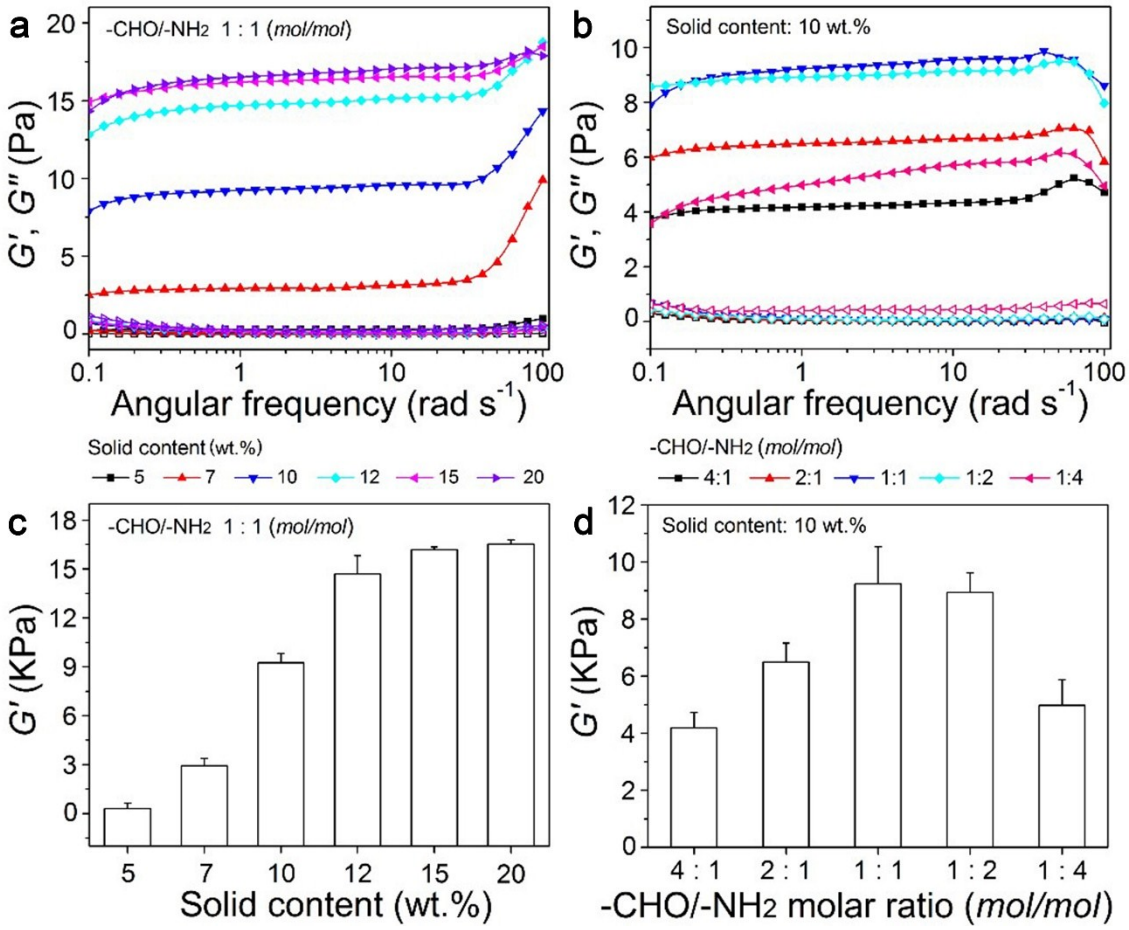

Figure S10. Rheological characterization of self-healing hydrogel with (a, c) different solid content and (b, d) different -CHO/-NH_2 molar ratio. The experiment was carried out under 1% strain and values in (c, d) represent G' at $\omega = 1$ rad s^{-1}.

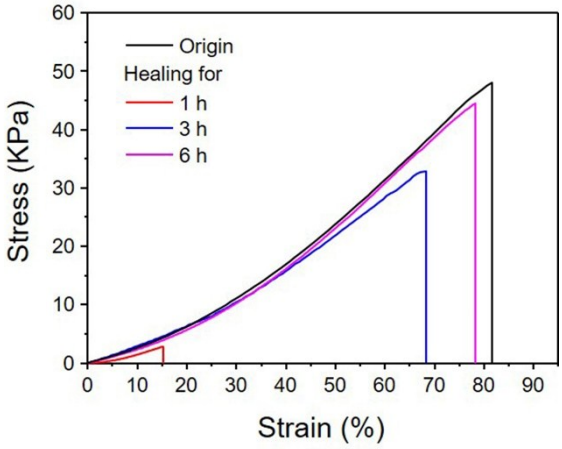

Figure S11. Tensile test of the PLGA based self-healing hydrogel after different healing period.

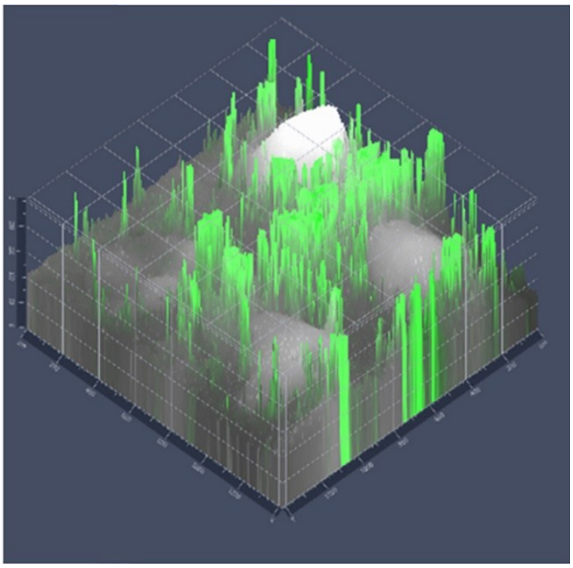

Figure S12. Fluorescent images of Dio labelled ASCs in the PLGA based tough porous hydrogel skeleton.

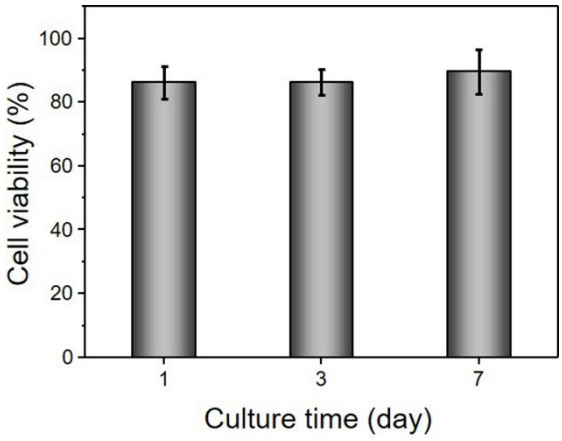

Figure S13. Cell viability after culture for 1, 3, and 7 days in the PLGA based composite hydrogel.

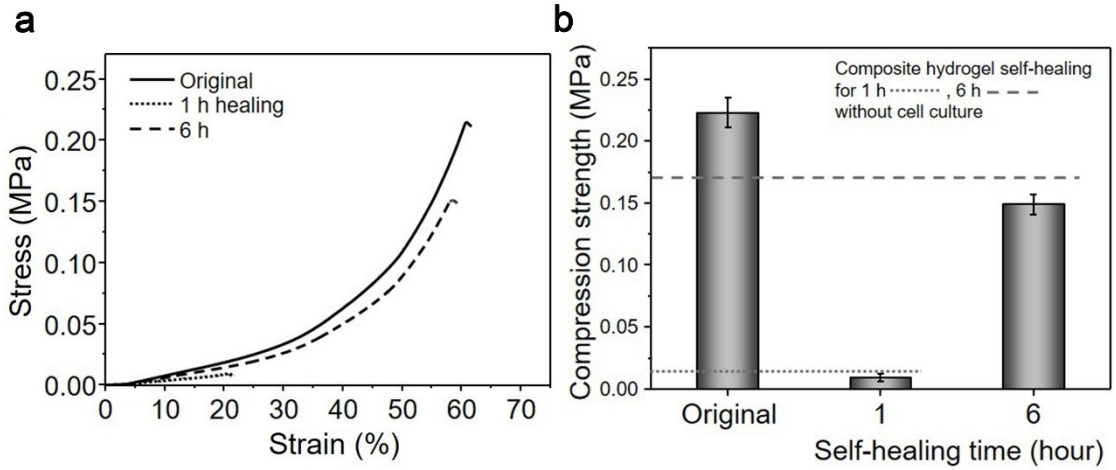

Figure S14. Self-healing of the composite hydrogel after cell seeding. (a) Compressive stress-strain curves. (b) Compression strength at different self-healing period.

Table S1. Characterization of PLGA-*g*-PCL.

Polymer	Feed ratio (mol/mol)	DP[a]	M_n[a]	M_n[b]	PDI[b]
BA-PCL	BA/ε−CL (1 : 20)	21	2400	12300	1.10
PLGA-*g*-PCL	PCL/COOH (1 : 10)	Grafting ratio[a]: 9.8			

a was determined by ^{1}H NMR. b was determined by GPC.