

Supplementary Data

Enzymatically cross-linked hydrogels based on a linear
poly(ethylene glycol) analogue for controlled protein
release and 3D cell culture

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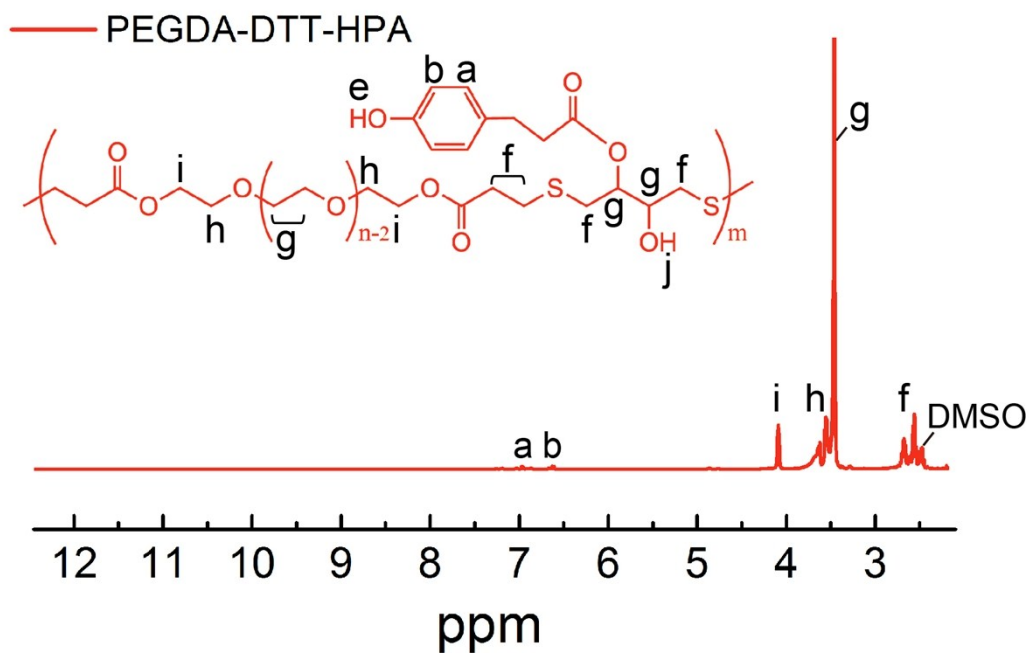


Fig. S1. ^1H NMR spectrum of the PEGDA-DTT-HPA copolymer in $\text{DMSO-}d_6$ after D_2O exchange.

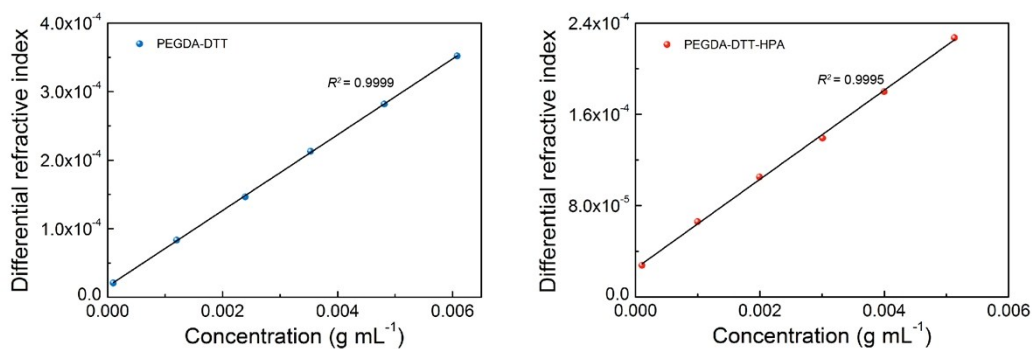


Fig. S2. dn/dc results of the indicated samples determined by a refractive index detector in DMF.

Table S1. Effect of molar ratio on the properties of PEGDA-DTT-HPA.

Entry	Sample	Molar ratio ^a	DS_{HPA} ^b	Solubility in water	Gel formation by HRP
1	PEGDA-DTT-HPA-1	0.04	0.035	soluble	+
2	PEGDA-DTT-HPA-2	0.14	0.13	soluble	+
3	PEGDA-DTT-HPA-3	0.80	0.425	insoluble	-

^a Molar ratio of 3-(4-hydroxyphenyl) propionic acid (HPA) to the hydroxyl groups of the PEGDA-DTT copolymer; ^b Determined by ^1H NMR.

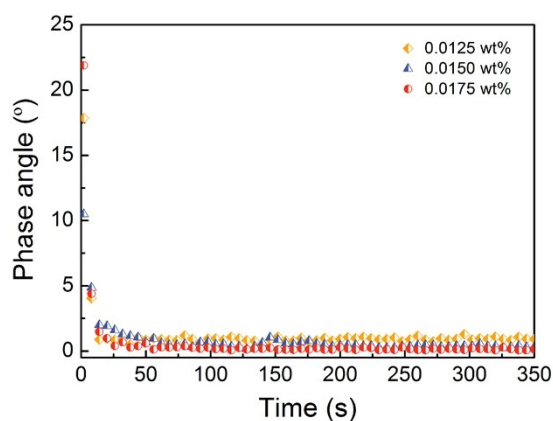


Fig. S3. Phase angle (δ) of PEGDA-DTT-HPA hydrogels with varying concentrations of H_2O_2 as a function of time. The measurement was taken with constant strain of 1.0% (selected according to the LVER test) and the oscillation frequency was set at 1 Hz. The DS_{HPA} of PEGDA-DTT-HPA was 0.13. The final concentrations of the PEGDA-DTT-HPA copolymer and HRP were 8.0 wt% and 0.0125 mg mL⁻¹, respectively for all the tested samples.

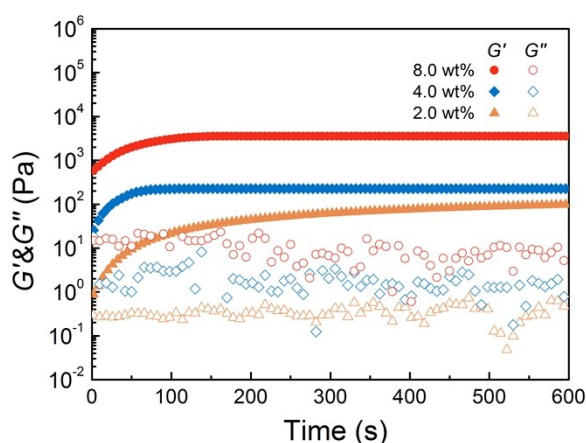


Fig. S4. Storage modulus G' and loss modulus G'' of PEGDA-DTT-HPA hydrogels with indicated concentrations of the PEGDA-DTT-HPA copolymer as a function of time. The measurement was taken with constant oscillation strain of 1.0% (selected according to the LVER test) and the oscillation frequency was set at 1 Hz. The DS_{HPA} of PEGDA-DTT-HPA was 0.13. The final concentrations of H_2O_2 and HRP were 0.0175 wt% and 0.0125 mg mL⁻¹, respectively for all the tested samples.

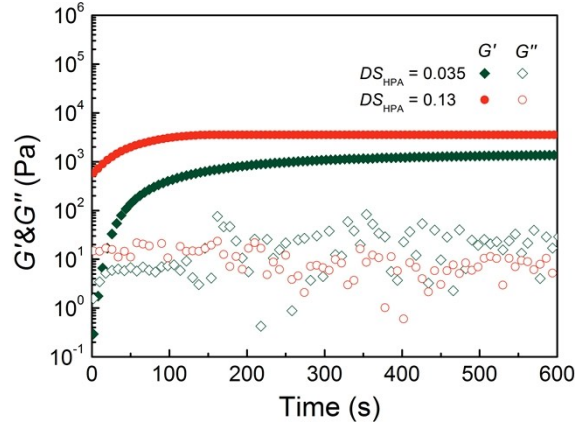


Fig. S5. Storage modulus G' and loss modulus G'' of PEGDA-DTT-HPA hydrogels with different DS_{HPA} of PEGDA-DTT-HPA as a function of time. The measurement was taken with constant oscillation strain of 1.0% (selected according to the LVER test) and the oscillation frequency was set at 1 Hz. The final concentrations of PEGDA-DTT-HPA ($DS_{\text{HPA}} = 0.035$, $DS_{\text{HPA}} = 0.13$), H_2O_2 and HRP were 8.0 wt%, 0.0175 wt% and $0.0125 \text{ mg mL}^{-1}$, respectively for all the tested samples.

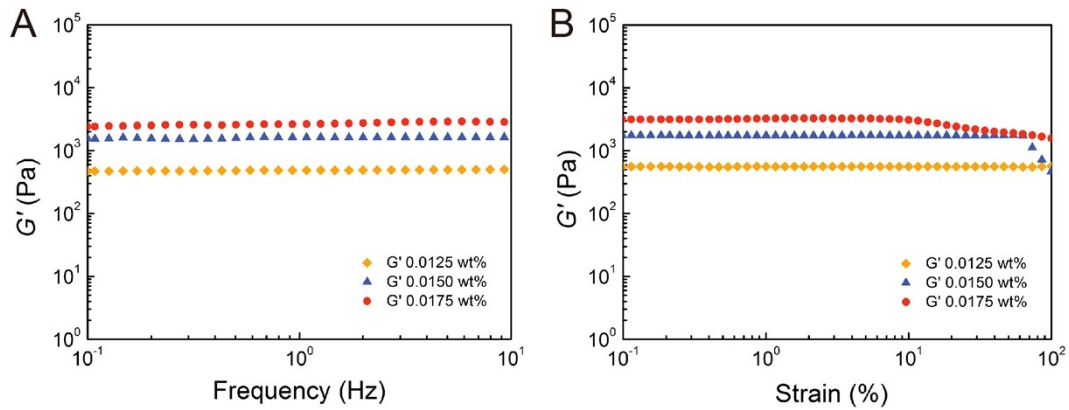


Fig. S6. (A) Frequency sweep and (B) amplitude sweep of PEGDA-DTT-HPA hydrogels with varying concentrations of H_2O_2 . The DS_{HPA} of PEGDA-DTT-HPA was 0.13. The final concentrations of the PEGDA-DTT-HPA copolymer and HRP were 8.0 wt% and $0.0125 \text{ mg mL}^{-1}$, respectively for all the tested samples.

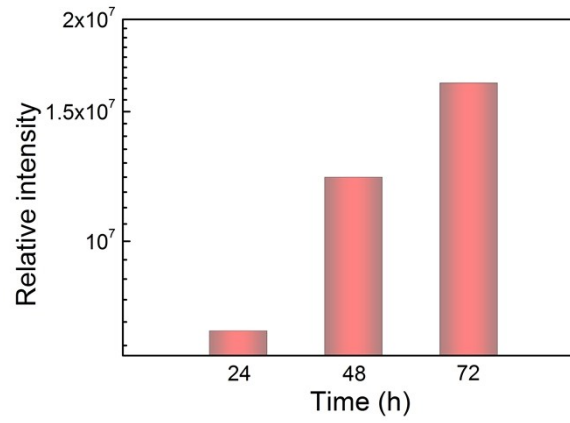


Fig. S7. Relative fluorescent intensity of 3D confocal microscopy images of hMSCs-LifeAct-EGFP in Gel-2 after culture for 24, 48, and 72 h determined by confocal laser scanning microscope.