Supplementary Information

Electrostatically Reinforced Acid-Stable Polysaccharide Hydrogels for Promoting Gastric Ulcer Repair

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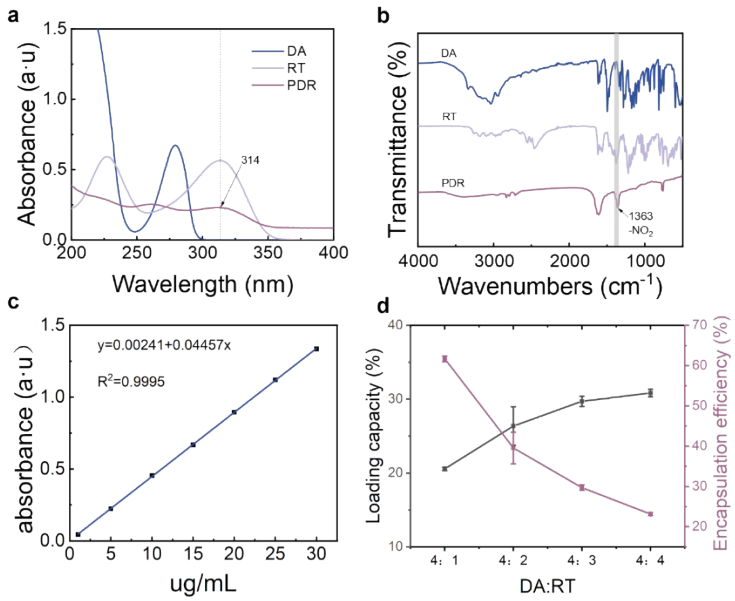

Figure S1. UV-vis spectra (a) and Fourier transform infrared spectra (b) of PDR nanoparticles, DA, and RT (c) Standard curve of RT at 314 nm (d) Drug loading capacity and loading efficiency of PDR

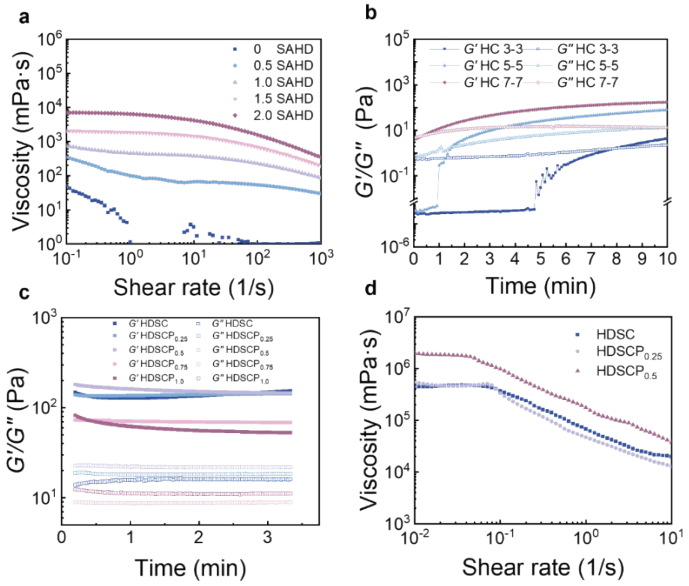

Figure S2. Rheological test data. (a) Shear rate scanning of precursor solutions with different SA addition amounts (0.5SAHD denotes a hydrogel precursor solution containing 0.5 wt% SA). (b) Gelation time test of hydrogels with different solid contents of HD and CMCS (HC 3-3 denotes a 3 wt% 1:1 mixture of two hydrogel precursor solutions). (c) Time scanning of hydrogels with different PDR addition amounts (0, 0.25, 0.5, 0.75, 1 mg/mL). (d) Shear rate scanning of hydrogels with different nanoparticle contents.

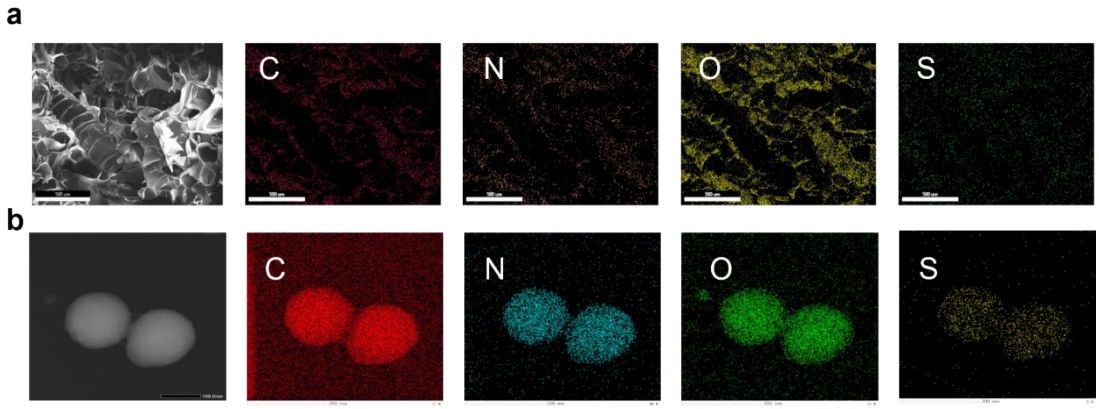

Figure S3. (a) SEM images and EDS energy spectrum analysis (C, N, O, S) of $HDSCP_{0.5}$ (b) TEM images and EDS energy spectrum analysis (C, N, O, S) of PDR

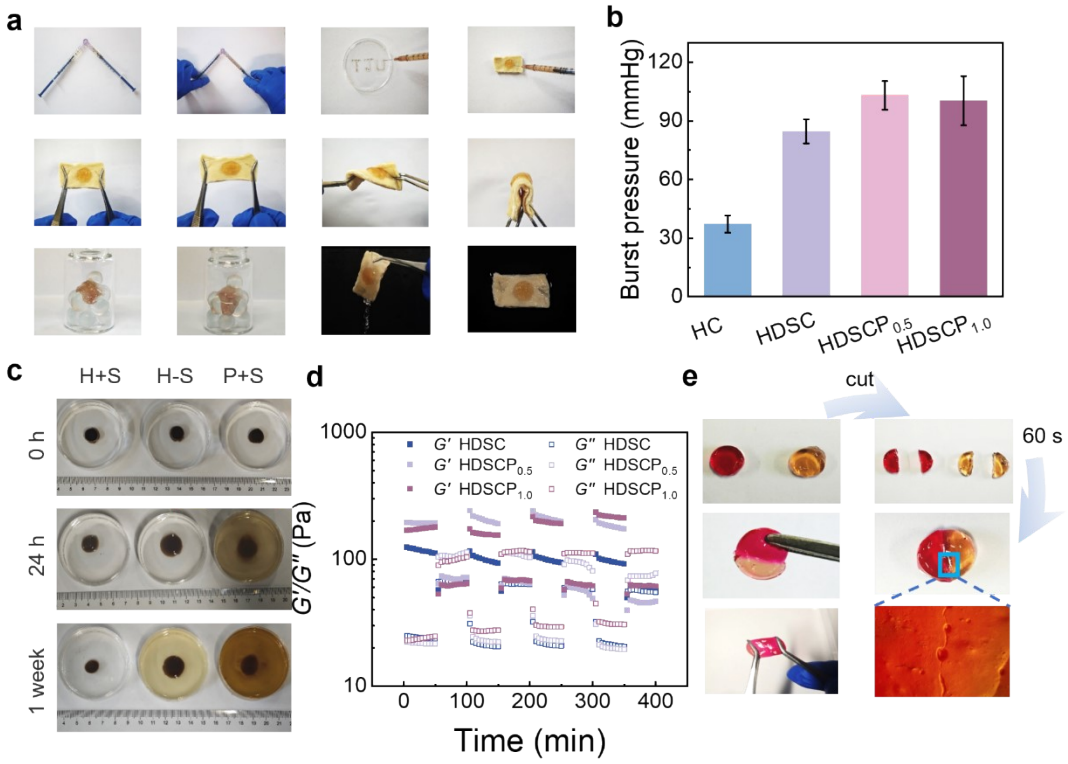

Figure S4. (a) Optical photos of the injectability and adhesiveness of the hydrogel. (b) Burst pressure test (c) Swelling images of hydrogels under different conditions (H+S: HDSCP hydrogel under acidic conditions; H-S: SA-free hydrogel under acidic conditions; P+S: HDSCP hydrogel under neutral conditions) (d) Step strain sweep of hydrogels (e) Optical photographs of hydrogel self-healing

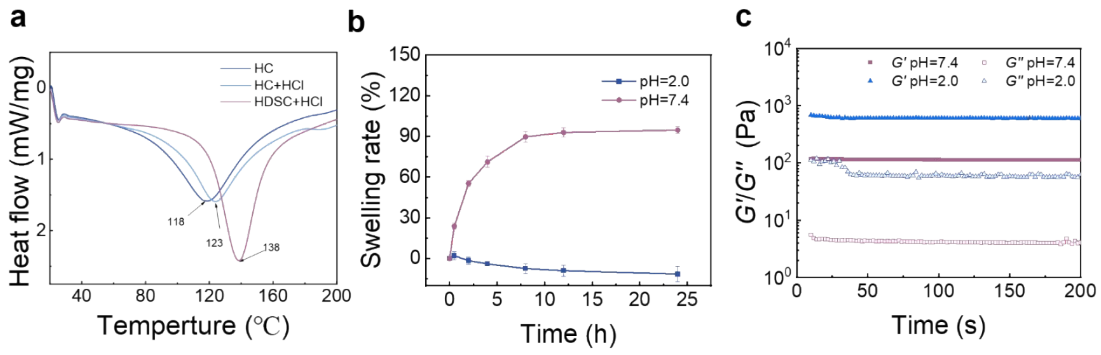

Figure S5. (a) TG test results of HC hydrogels; HC, HDSC hydrogels after immersion in hydrochloric acid solution. (b) Swelling curves of HDSC hydrogels under different pH conditions. (c) Rheological time scans of HDSC hydrogels after immersion under different pH conditions.

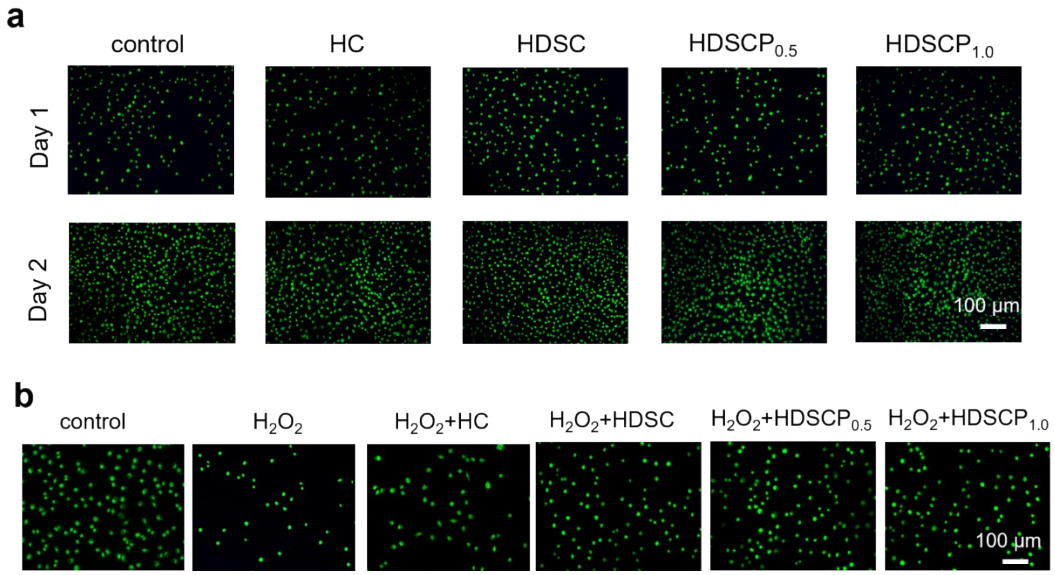

Figure S6. (a) Fluorescent photos of AO staining for the cytotoxicity of hydrogels in different groups. (b) Images of AO staining after the cells were co-cultured with the hydrogel for 4 h after the addition of H_2O_2.

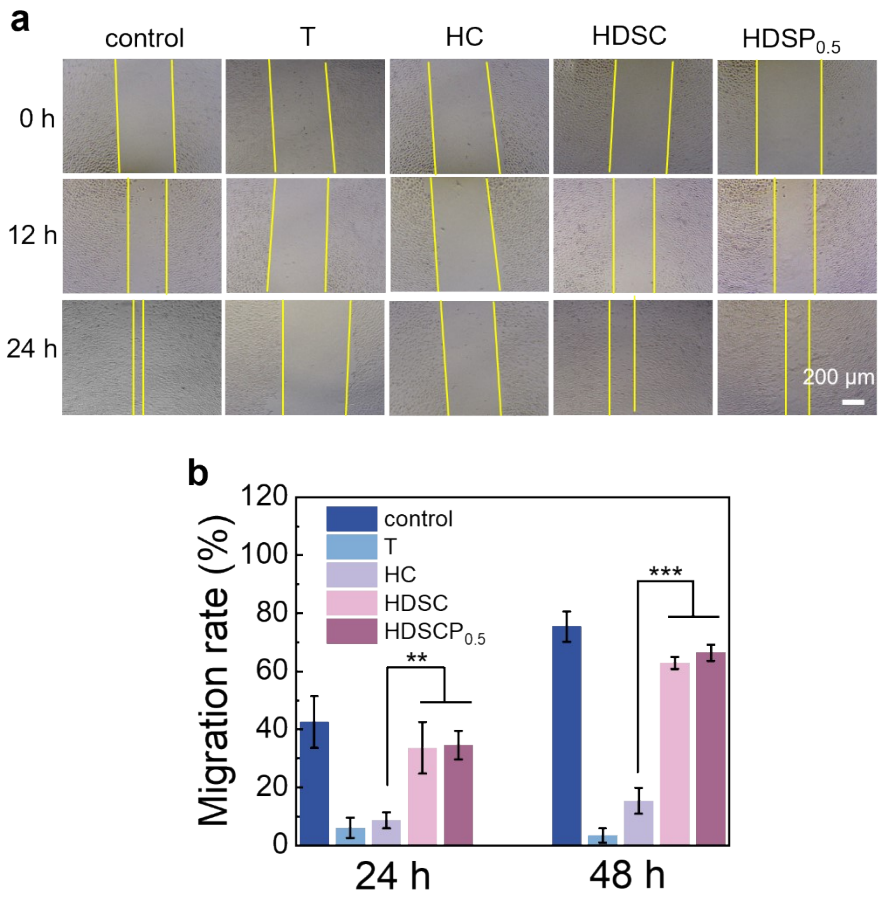

Figure S7. Transwell gastric acid isolation scratch assay (control denotes the untreated group; T denotes the group without hydrogel). (a) Optical microscope images. (b) Statistics of cell scratch migration rate, $n = 3$.

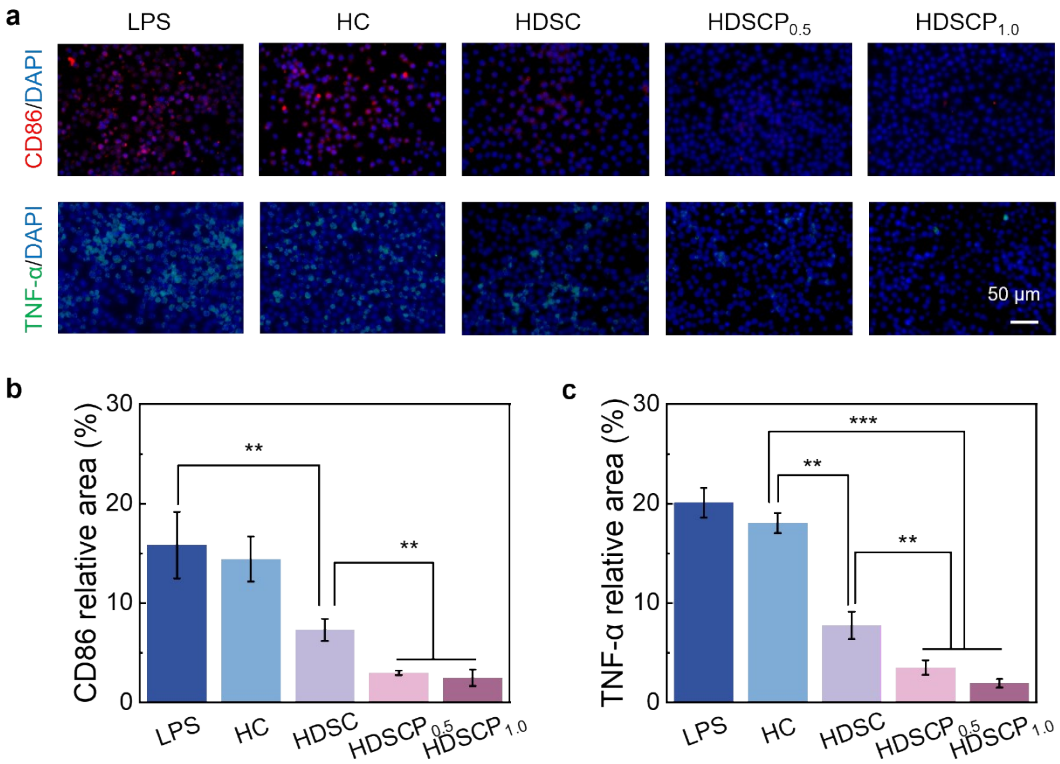

Figure S8. Inflammatory characterization of RAW 264.7 cells. (a) Immunofluorescence staining images of CD86 and TNF-α. (b) Quantification of CD86-positive fluorescent area. (c) Quantification of TNF-α-positive fluorescent area.

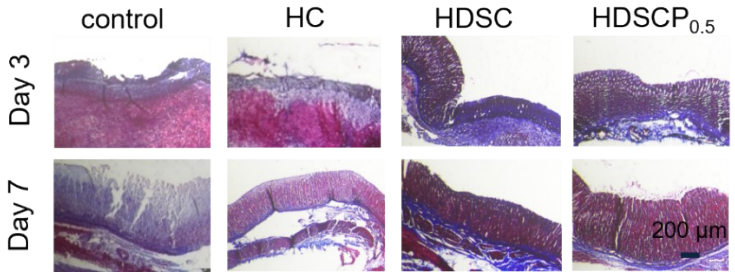

Figure S9. Optical microscopic images of Masson staining of tissues sample.

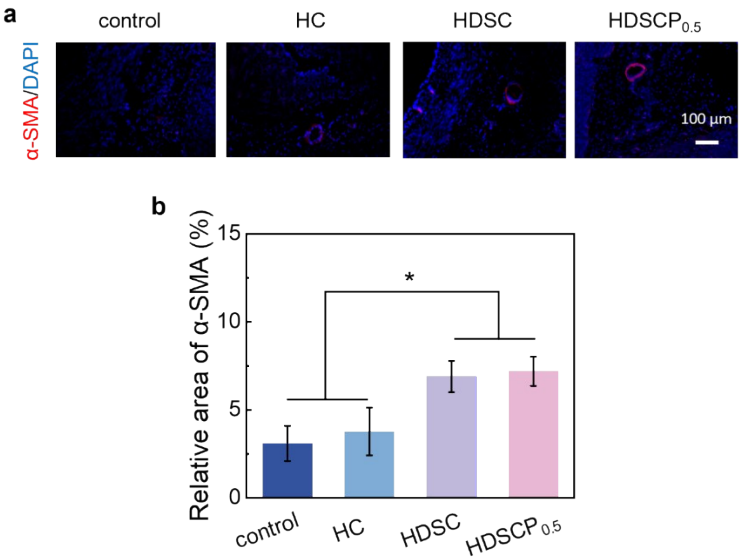

Figure S10. (a) a-SMA immunofluorescence staining on day 7 (b) Quantitative analysis of α-SMA (*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$).

Table S1. Hydrogel sample nomenclature and its composition

Sample	CMCS(wt%)	OHA(wt%)	HD(wt%)	SA(wt%)	PDR(mg/mL)
HC	2.5	2.5	0	0	0
HDSC	2.5	0	2.5	0.5	0
$HDSCP_{0.5}$	2.5	0	2.5	0.5	0.5
$HDSCP_{1.0}$	2.5	0	2.5	0.5	1.0

Table S2. PDR sample nomenclature and its composition

Sample	RT (mg)	DA (mg)
PDR1	50	200
PDR2	100	200
PDR3	150	200
PDR4	200	200