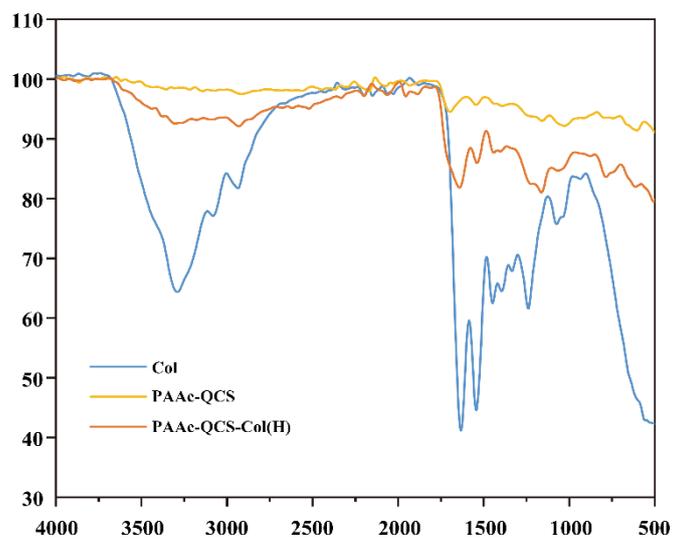
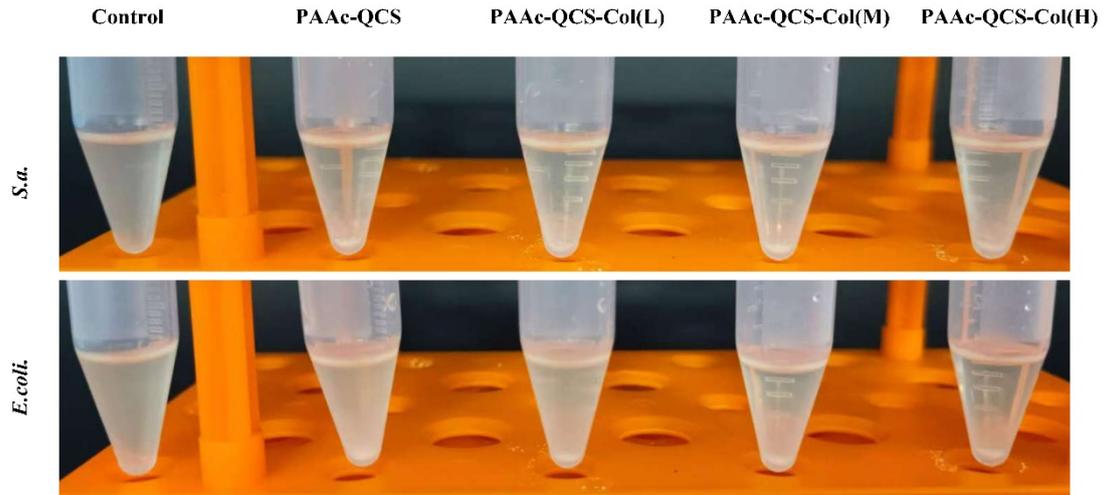


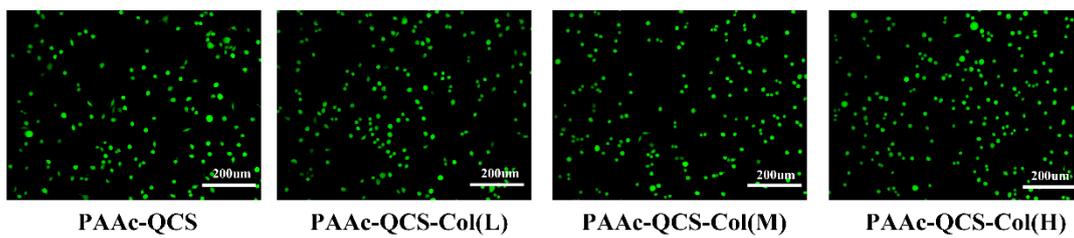
Supplementary Figure 1. SDS-PAGE profile of the extracted collagen.



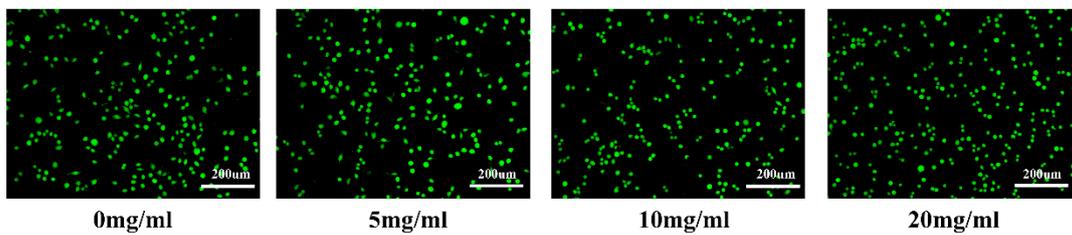
Supplementary Figure 2. FTIR spectra of Col, PAAc-QCS-Col and PAAc-QCS-Col(H)



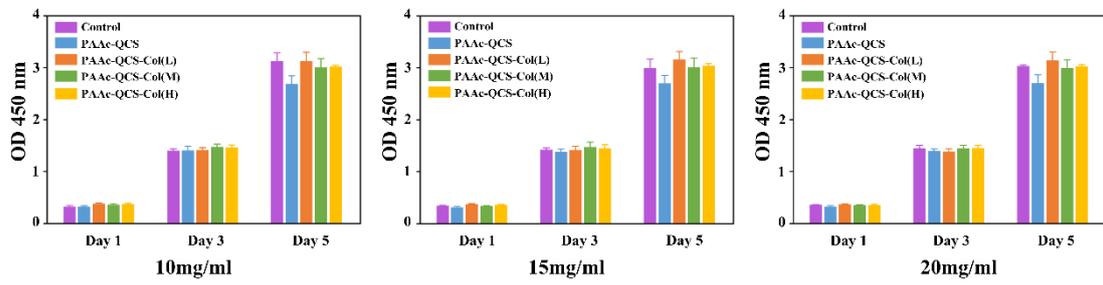
Supplementary Figure 3. Photographs of *Staphylococcus aureus* and *Escherichia coli* suspensions after co-culture with various hydrogel groups for 2 hours



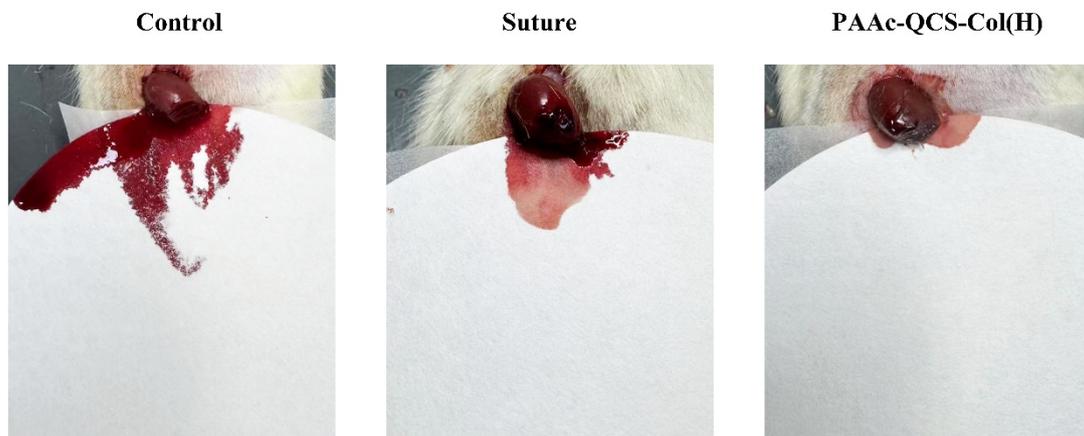
Supplementary Figure 4. LIVE/DEAD staining images of L929 cells after 24 hours of co-culture with different hydrogels at a concentration of 5 mg/mL.



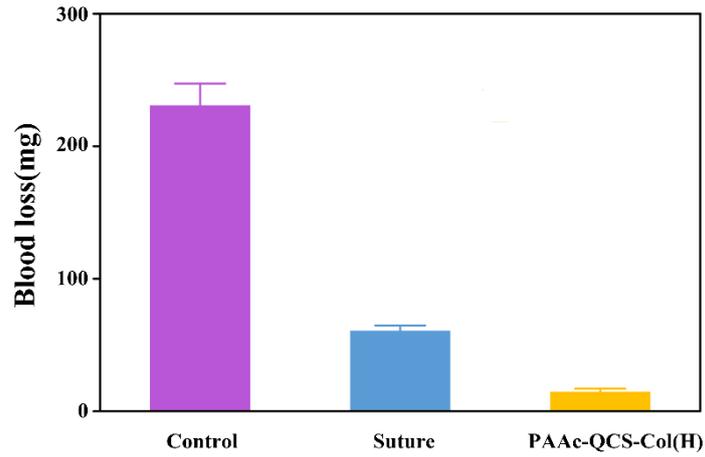
Supplementary Figure 5. LIVE/DEAD staining images of L929 cells after 24 hours of co-culture with PAAc-QCS-Col(H) hydrogel at concentrations of 0, 5, 10, and 20 mg/mL.



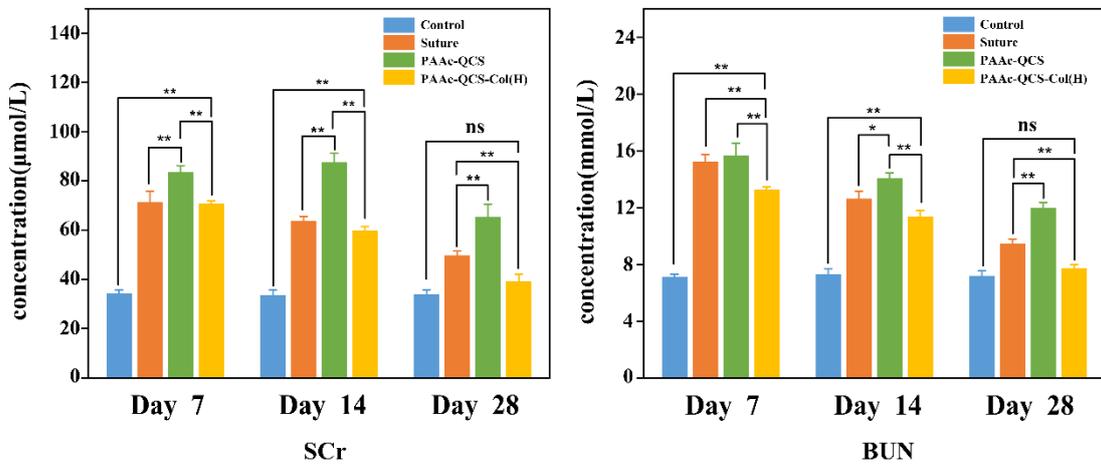
Supplementary Figure 6. Quantitative analysis of cell viability of murine L929 cells cultured in extracts of various hydrogels at concentrations of 10, 15, and 20 mg/mL.



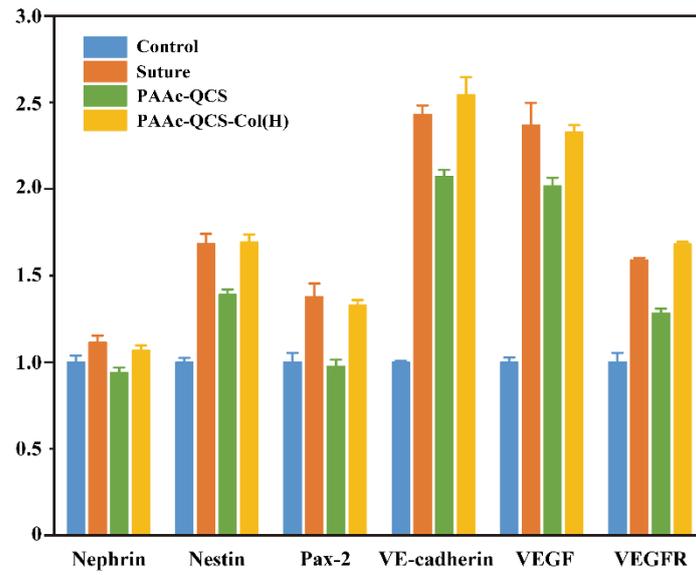
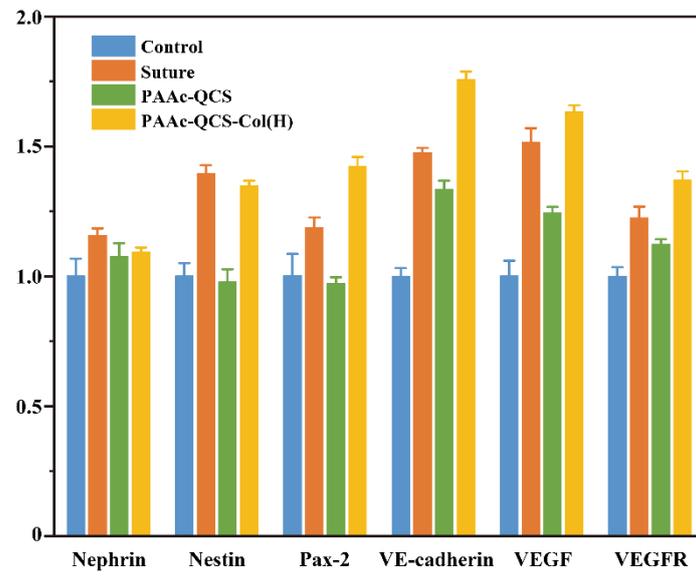
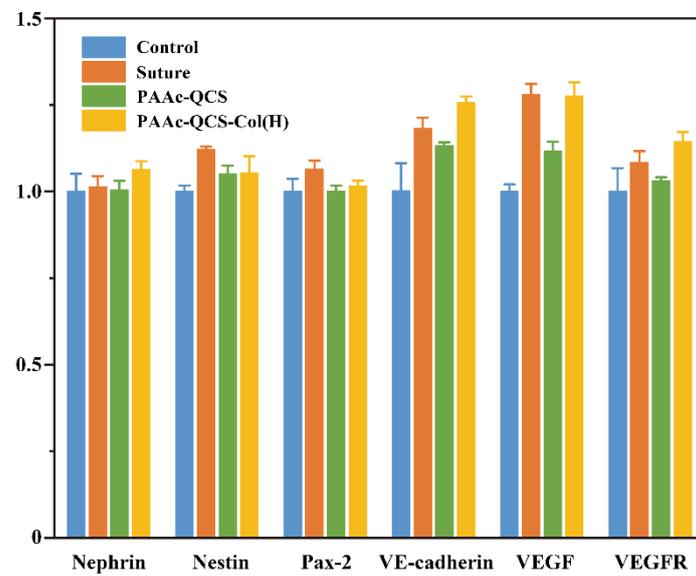
Supplementary Figure 7. Photographs of the hemostatic effect in a rat partial nephrectomy model.



Supplementary Figure 8. Quantitative data of blood loss in a rat partial nephrectomy model.



Supplementary Figure 9. serum creatinine(SCr) and Blood urea nitrogen (BUN) concentration in the control group, suture group, PAAc-QCS group and PAAc-QCS-Col(H) group on day 7, 14, and 28 respectively.

a**b****c**

Supplementary Figure 9. qRT-PCR analysis of renal mRNA expression for Nephrin, Nestin, Pax-2, VE-cadherin, VEGF, and VEGFR in different rat groups at (a) 1, (b) 2, and (c) 4 weeks post-operation.

gene	Forward	Reverse
nephrin	CCAGGACTATGCCCTCTTCAA	GAGTGAGGGCTTATGCTGACAAC
nestin	CCCTGAAGTCGAGGAGCTG	CTGCTGCACCTCTAAGCGA
PAX2	AAGCGACAGAACCCGACTATGT	ACTCCTGTCCCTGCCCCAT
VE-cadherin	TCGTGGTGGGAAGCACAAAGAT	TTGCCACACGGATATCTTCAG
VEGF	TGCCCCTAATGCGGTGT	TGCTGGCTTTGGTGAGGTT
VEGFR2	GAATGCGGGCTCCTGACTAC	GCACACTTCCTCTTCCTCCATAC

Supplementary Table S1. Sequences of primers used for quantitative real-time PCR