

Electronic Supplementary Information (ESI)

A Multifunctional Black Phosphorus Based Adhesive Patch Intrinsically Induces Partial EMT for Effective Burn Wound Healing

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Table S1. Primers used for real-time RT-PCR.

Primers' sequences (5' - 3')		
Target gene	Forward	Reverse
CDH1	CCCATCAGCTGCCAGAAAATGAA	CTGTCACCTTCAGCCATCCTGTTT
CK	ACTACCTGCAGCCGCCAGTT	CAGTTCTTGGTGC GA-AGGAC
CDH2	CAACTTGCCAGAAA ACTCCAGG	ATGAAACCGGGCTATCTGCTC
Vim	GACAATGCGTCTCTGGCACGTCTT	TCCTCCGCCTCCTGCAGGTTCTT
Snail1	GGTTCTTCTGCGCTACTGCTG	GTCGTAGGGCTGCTGGAAGG
GAPDH	GTGAAGGTCGGAGTCAACGGATT	CACAGTCTTCTGGGTGGCAGT

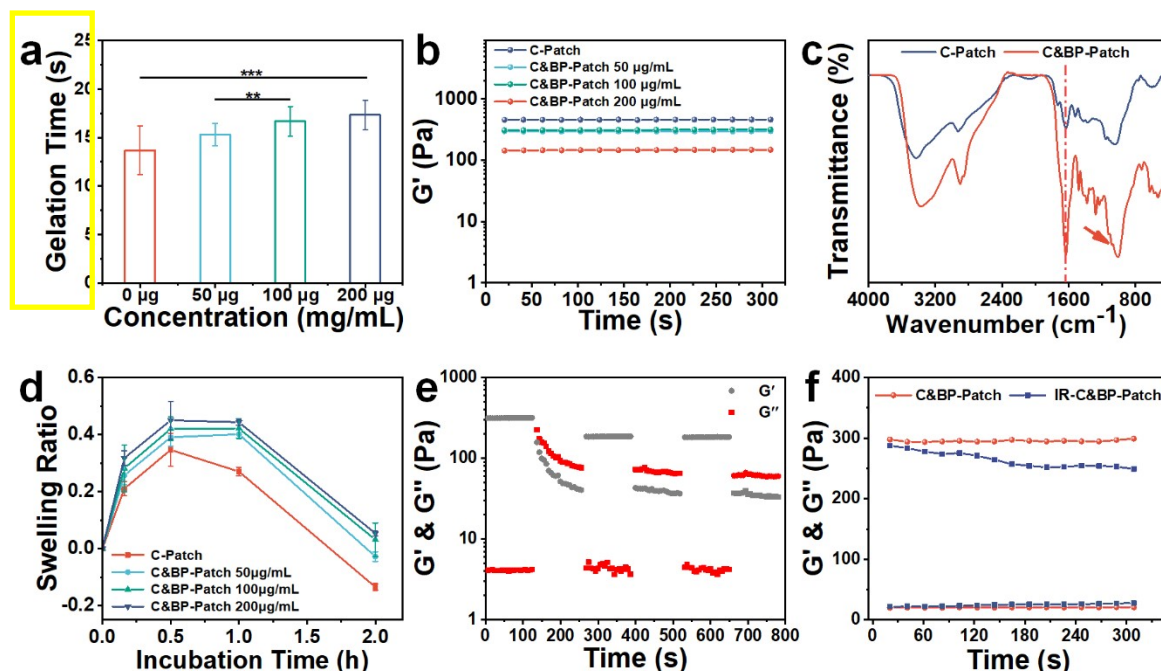


Figure S1. Characterizations of C&BP-Patch. a) Gelation time of the C&BP-Patch at different concentrations of BPNS (the concentration of BPNS was 0, 50, 100, and 200 $\mu\text{g/mL}$). b) Storage modulus (G') of C-Patch and C&BP-Patch scaffolds. c) FT-IR spectra of the C-Patch and C&BP-Patch. d) The swelling property of hydrogels. (i.e., in phosphate buffered saline at 37 $^{\circ}\text{C}$). e) Rheological behavior of hydrogels. The storage modulus (G') and loss modulus (G'') of C-Patch and C&BP-Patch. f) Rheological behavior of hydrogels with NIR irradiation. The storage modulus (G') and loss modulus (G'') of C&BP-Patch.

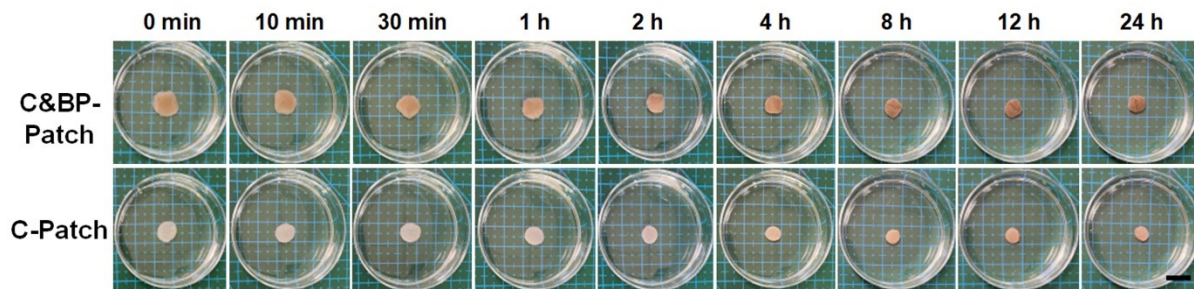


Figure S2. Swelling properties of the C-Patch and C&BP-Patch. Scale bar: 2 cm.

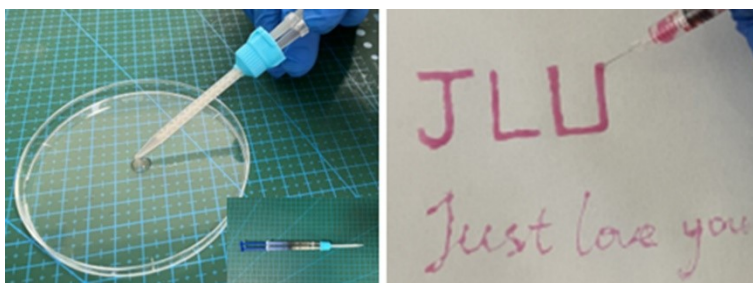


Figure S3. Evaluation of injectability of the C&BP-Patch with a double barrel spiral needle. The injection process of a hybrid hydrogel. The C&BP-Patch can pass through the needle (29 G), then JLU (Just love you) was drawn.

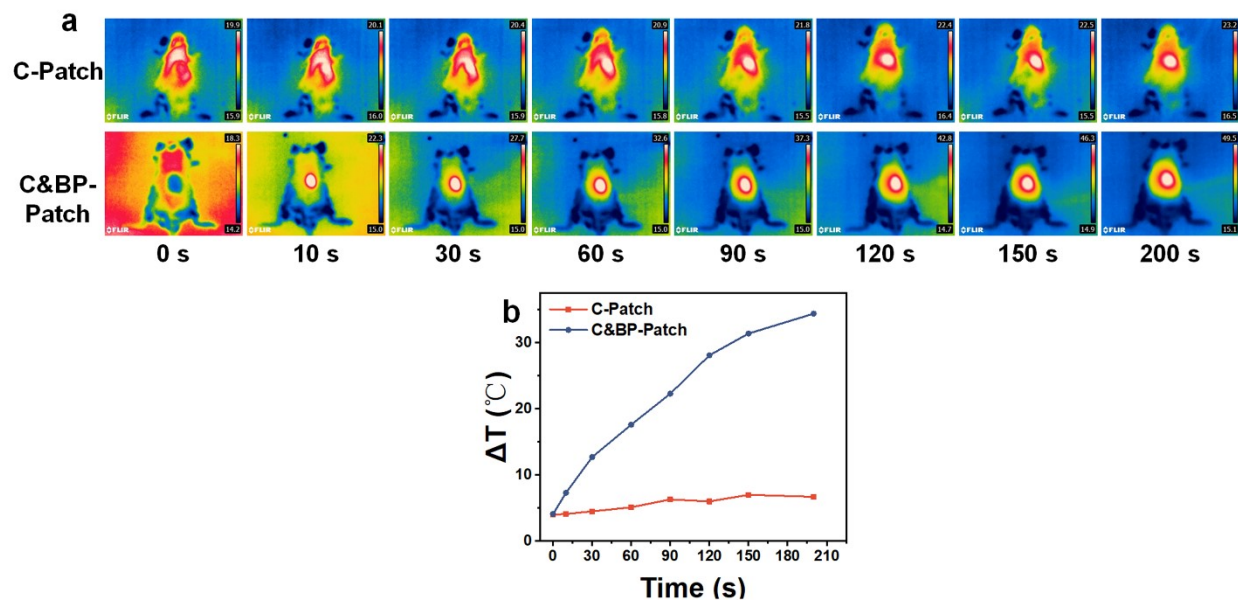


Figure S4. Temperature variation of skin wound surface. a) Thermal images and b) temperature curves of C-Patch and C&BP-Patch under NIR irradiation *in vivo*.

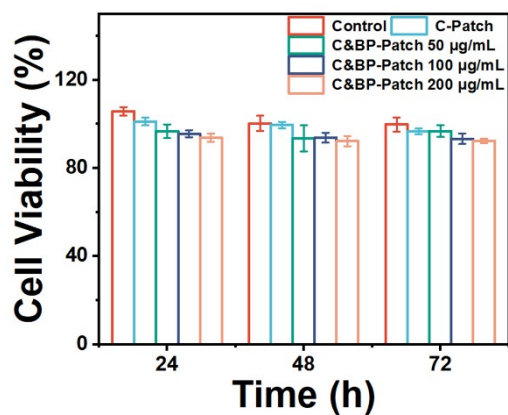


Figure S5. Cell viability of the C&BP-Patch at different concentrations of BPNS at 24 h, 48 h, and 72 h.

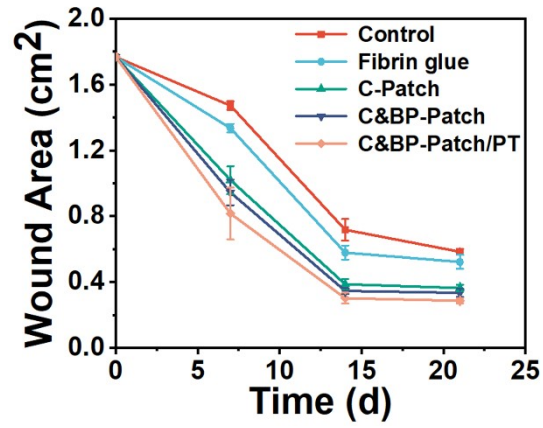


Figure S6. Wound areas of mice skin burn at 7 d, 14 d and 21 d.

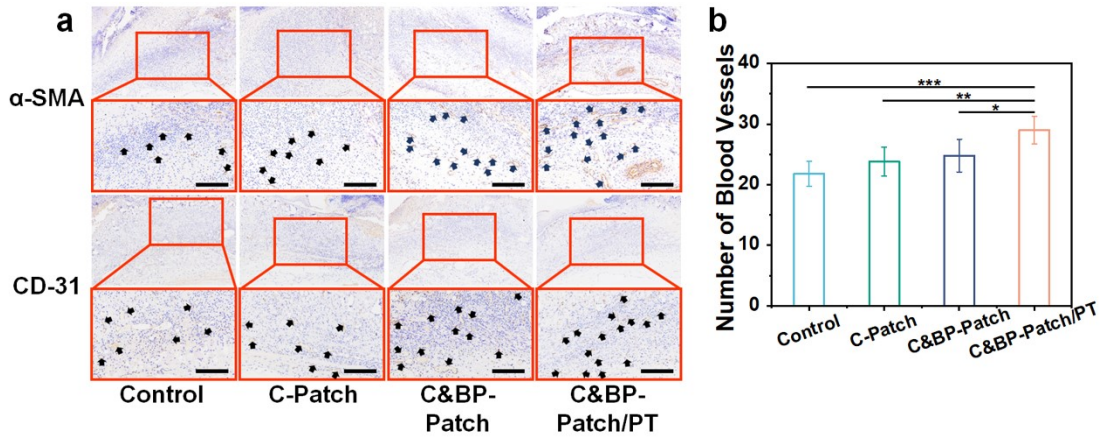


Figure S7. The C&BP-Patch promoted angiogenesis in cutaneous infectious burn wounds. a) and b) IHC staining of vascular markers (α -SMA and CD31) and number of blood vessels in different groups. Scale bar: 100 μ m.

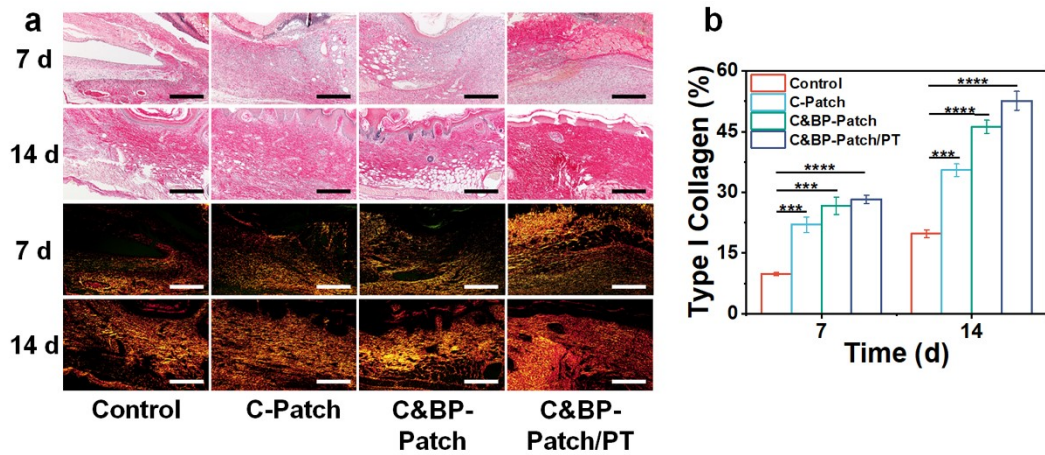


Figure S8. The C&BP-Patch promoted the deposition of collagen in cutaneous infectious burn wounds. a) Sirius red staining of skin burns on day 7 and day 14. The type III collagen fibers were green and the type I collagen fibers were bright yellow or red. Scale bar: 400 μm . b) Content of type I collagen in mice skin burns.

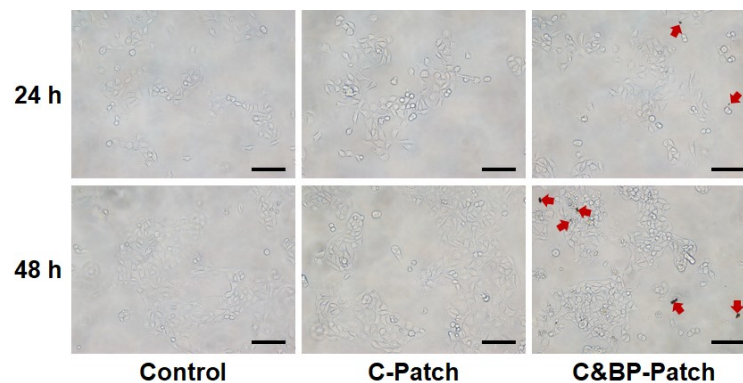


Figure S9. Cell co-cultured with C-Patch the C&BP-Patch at 24 h and 48 h. Red Arrow: BPNS contained in C&BP-Patch. Scale Bar: 200 μm .

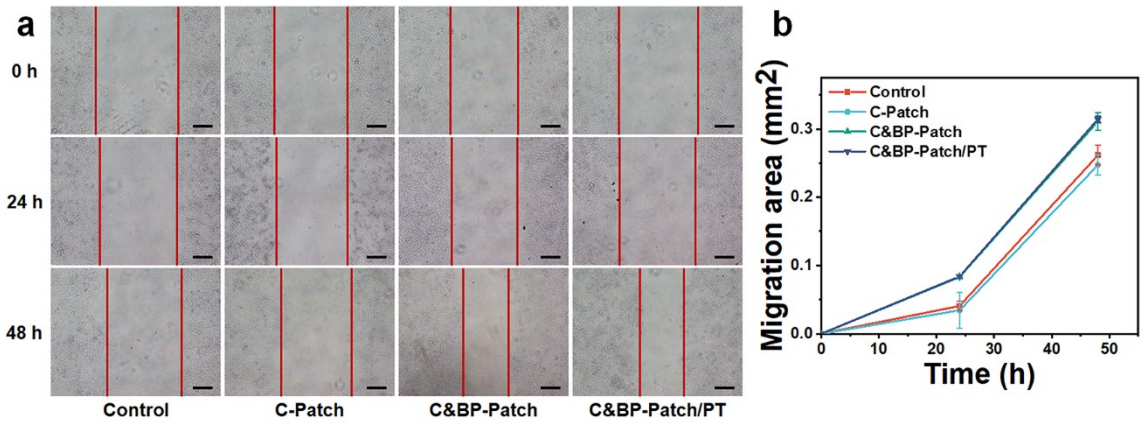


Figure S10. Cell migration *in vitro*. a) Cell motility of HaCaT cells treated with C-Patch, C&BP-Patch and C&BP-Patch/PT by scratch assay and observed by microscopy. Scale bar: 200 μ m. b) Migration area of HaCaT cells cultured with C-Patch, C&BP-Patch and C&BP-Patch/PT.

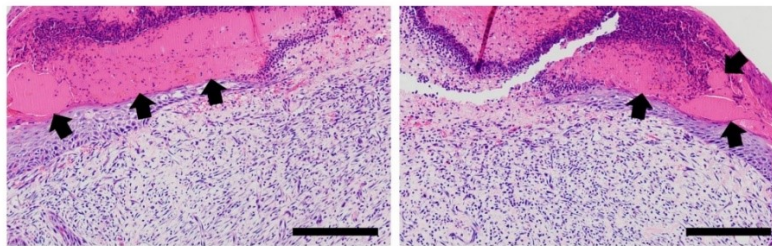


Figure S11. The hydrogels remained and mixed with eschar at 7 d *in vivo*. Black arrows: the remaining hydrogels. Scale Bar: 200 μ m.

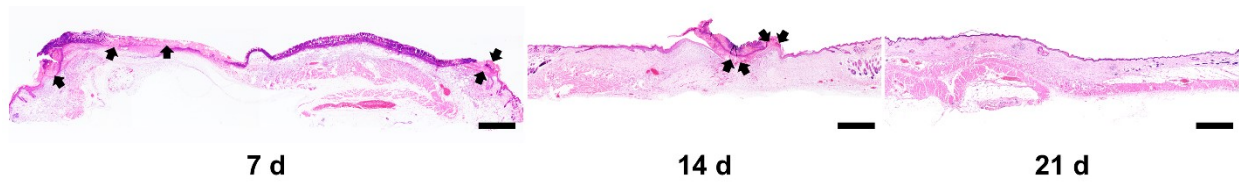


Figure S12. The hydrogels degraded on burn wounds within 14 d. Black arrows: The remaining hydrogels. Scale Bar: 1 mm.