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Electronic Supplementary Information

A Carbonized Wormwood Modified Photothermal Microneedle Patch for Repair of Damaged Skeletal Muscle

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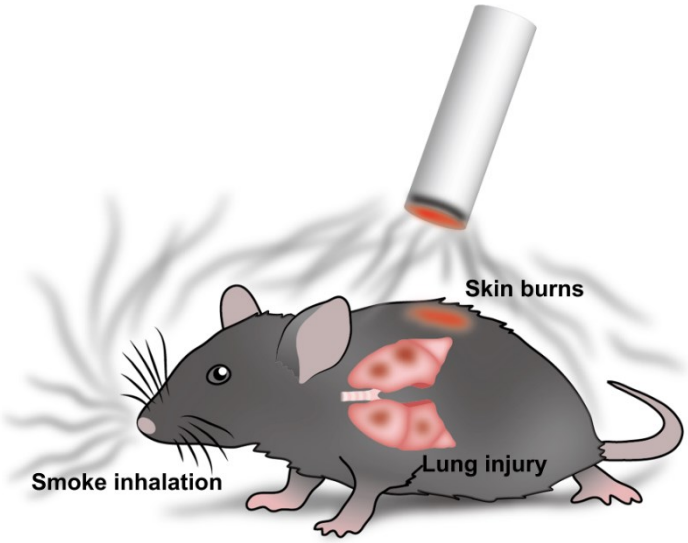

Figure S1. Schematic diagram of the side effects of moxibustion treatment.

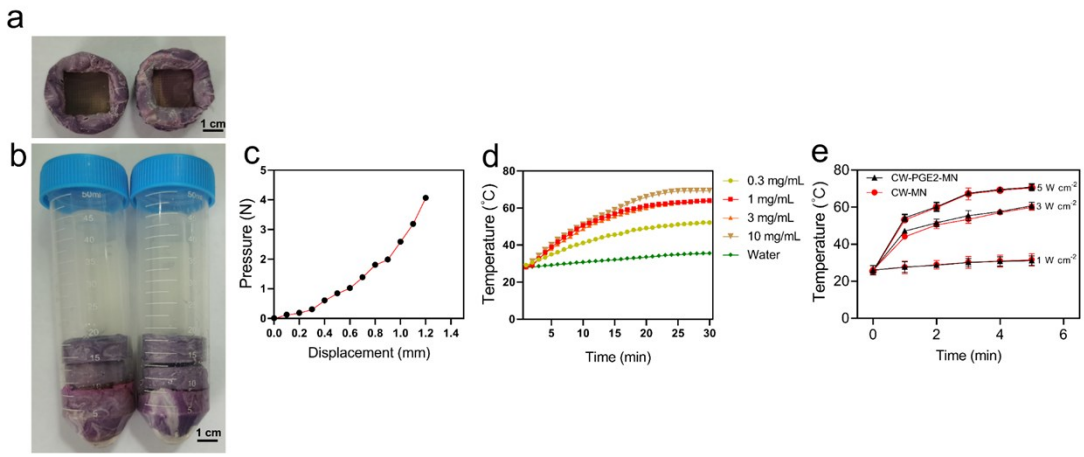

Figure S2. a) MN mold properties. b) Centrifuge tube used in the process of making MN (scale bar = 1 cm). c) Pressure test of MN puncture skin. d) The photothermal heating performances of different concentrations wormwood solution under 808 nm NIR. e) The photothermal of the microneedle patch under different laser power densities.

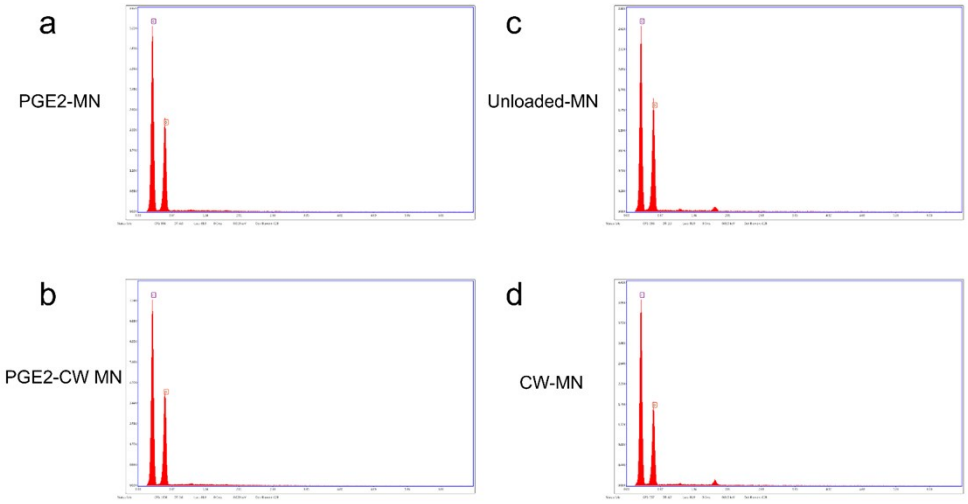

Figure S3. Energy spectrum analysis of four types of MN patches.

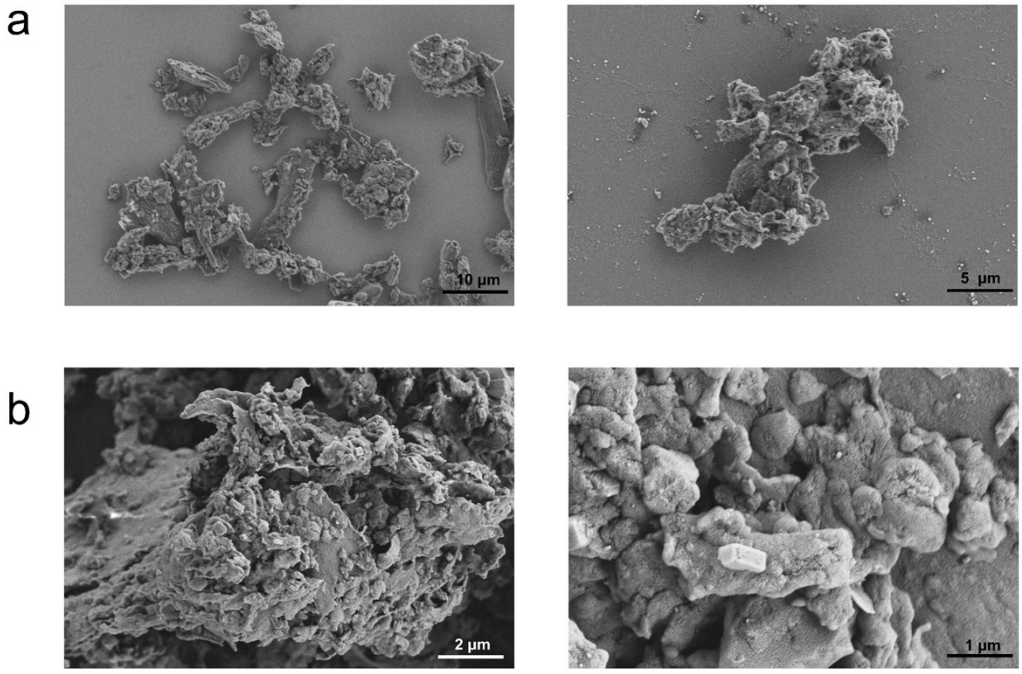

Figure S4. Scanning electron microscope images of wormwood powder. a) before carbonization. b) after carbonization.

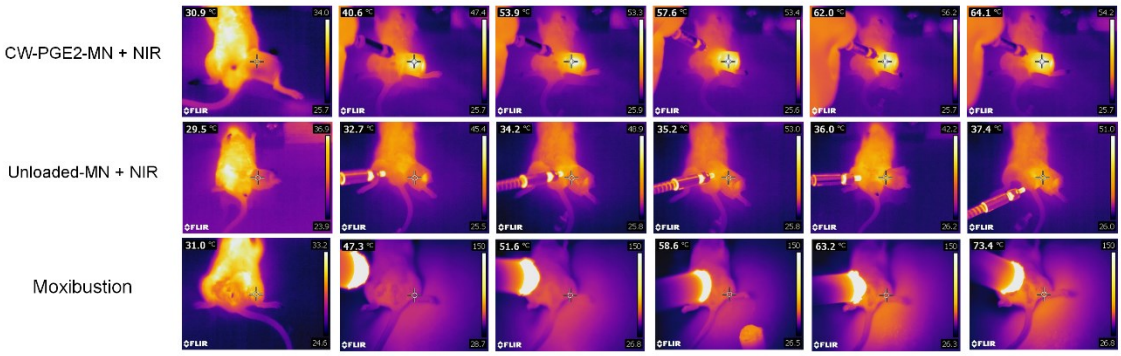

Figure S5. Recording of the heating effect of CW-MN and Unloaded-MN loaded with PGE2 under 808 nm infrared radiation and during the treatment of burning moxibustion strip.

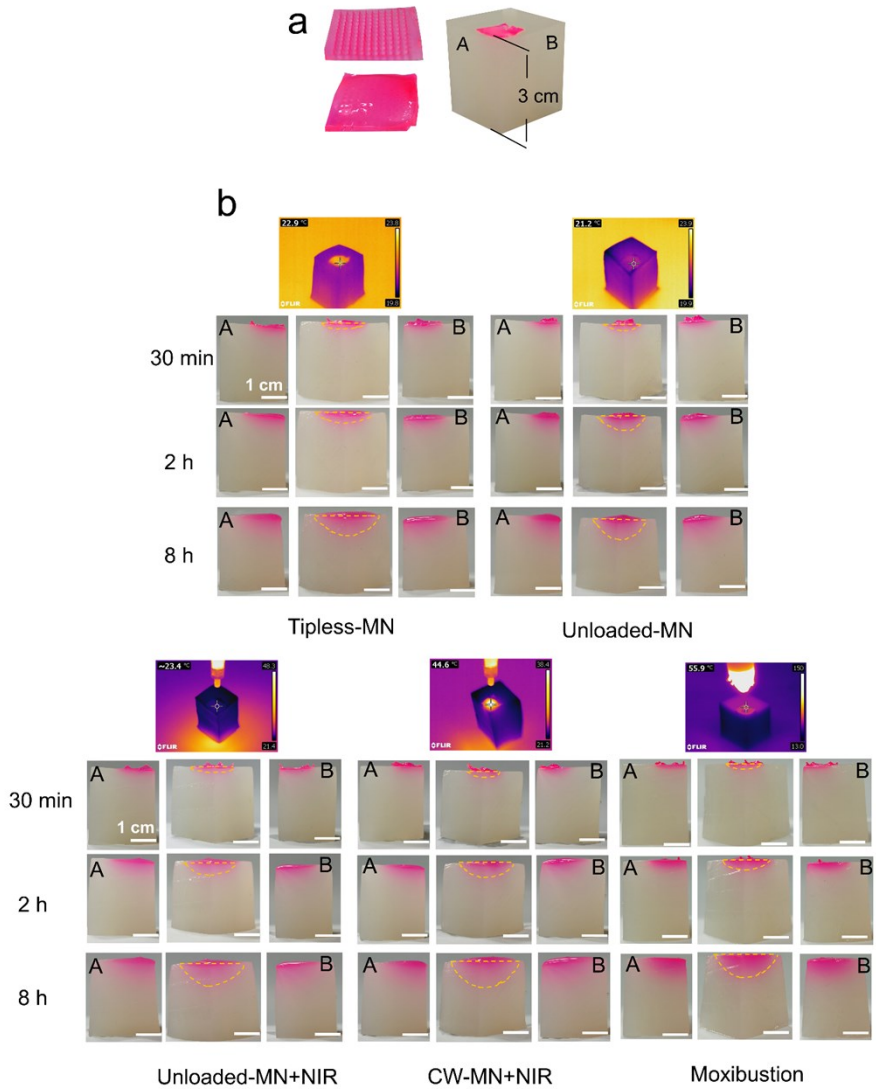

Figure S6. a) Schematic diagram of the penetration experiments. b) Supplementary diagram of the Rhodamine B MN penetration experiment (scale bar= 1 cm).

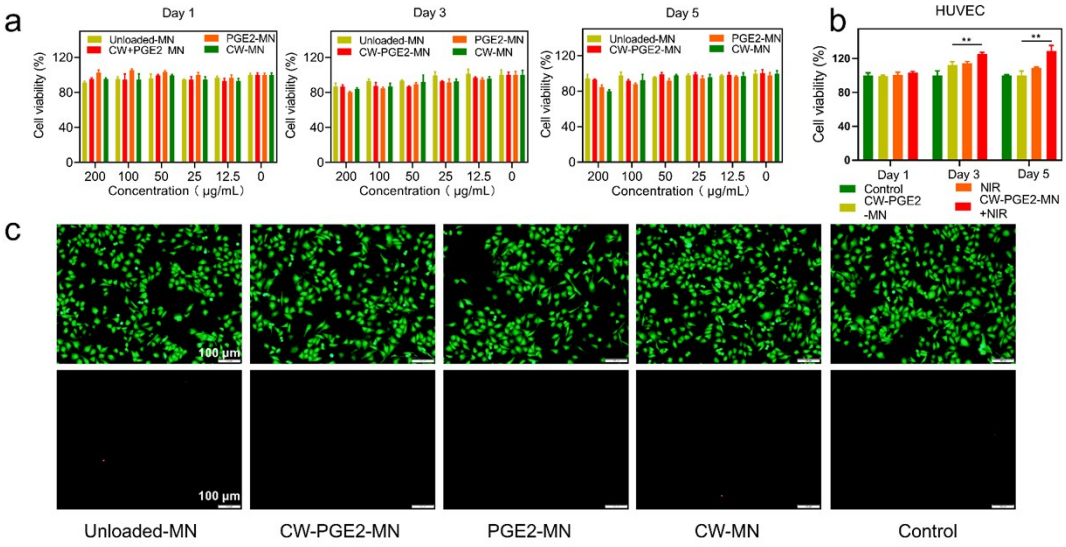

Figure S7. a) The effects of the MN patches with different concentrations (12.5, 50, 100, 200 μg/mL) on the viability of L929 cells on the 1st, 3rd and 5th days after treatment. b) The effect of 808 nm infrared radiation on HUVEC cell viability. c) Live and dead cell staining experiment.

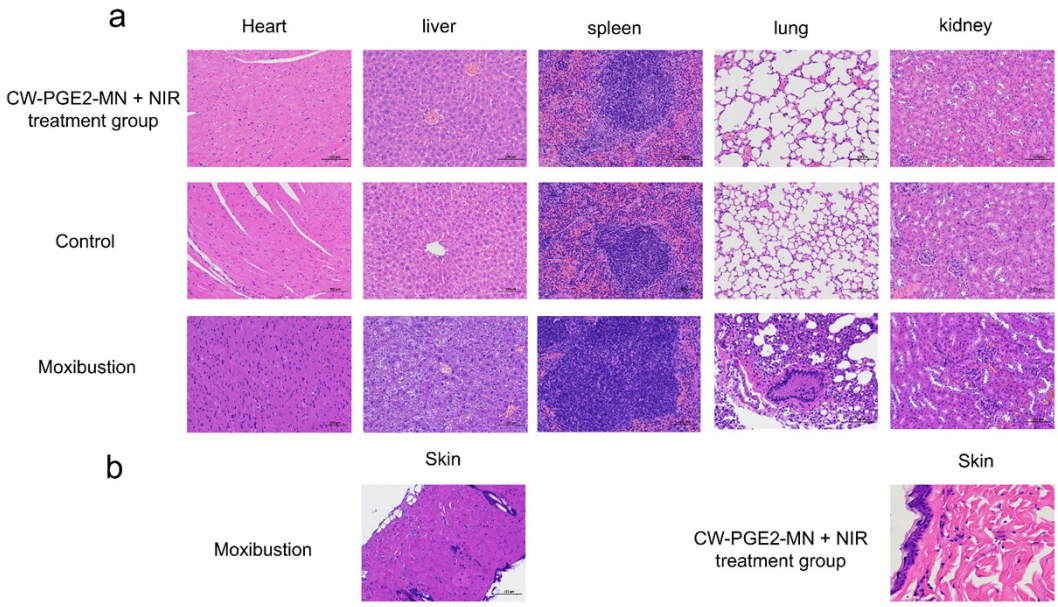

Figure S8. a) After three weeks of treatment, H&E staining of heart, liver, spleen, lung and kidney. b) Skin staining of mice in the moxibustion treatment and the carbonized wormwood drug-loaded MN patch treatment group.

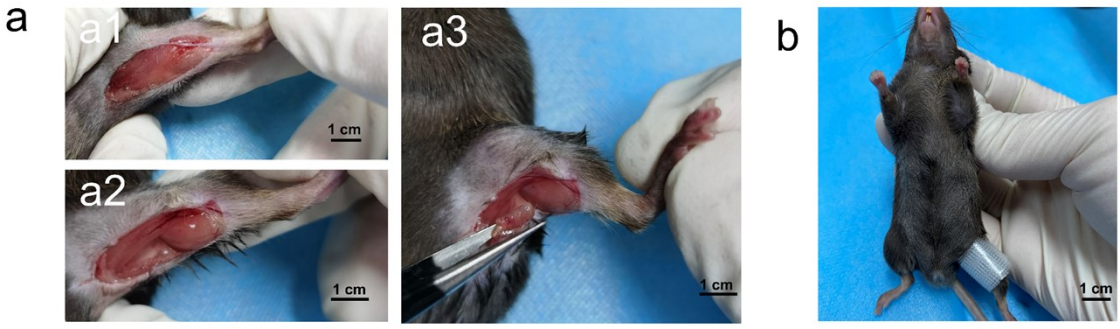

Figure S9. Modeling process. a1) Normal mouse gastrocnemius muscle. a2) Model mouse gastrocnemius muscle. a3) Recording diagram of the removed gastrocnemius muscle. (Scale = 1 cm). a4) Schematic diagram of patch attachment during experimental treatment.