

# **Dissolving Microneedles Encapsulating Drug-Loaded Nanoparticles and Recombinant Humanized Collagen Type III for the Treatment of Chronic Wound via Anti- inflammation and Enhanced Cell Proliferation and Angiogenesis**

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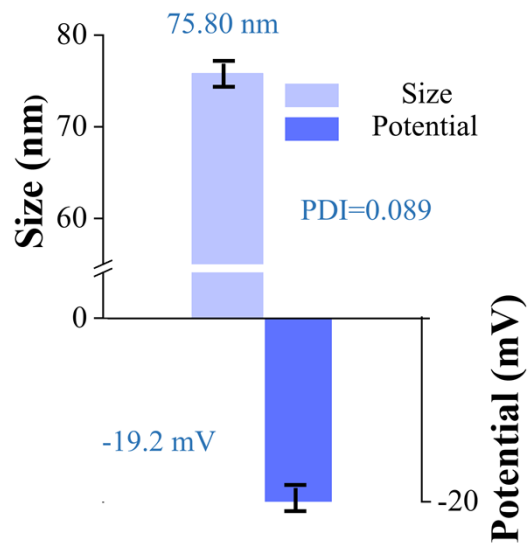
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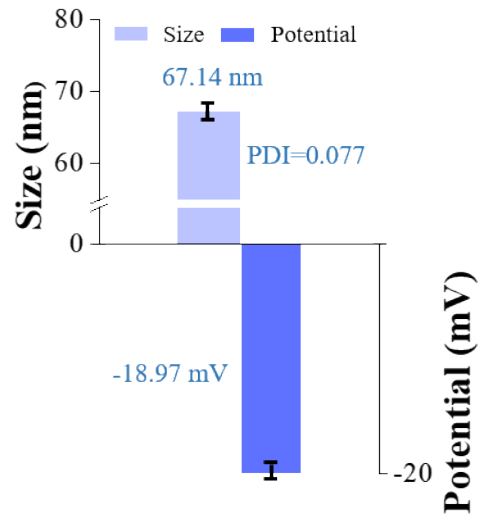
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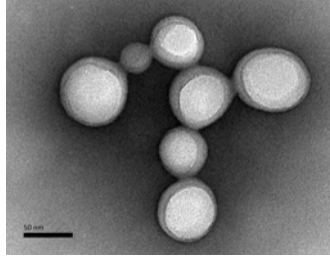
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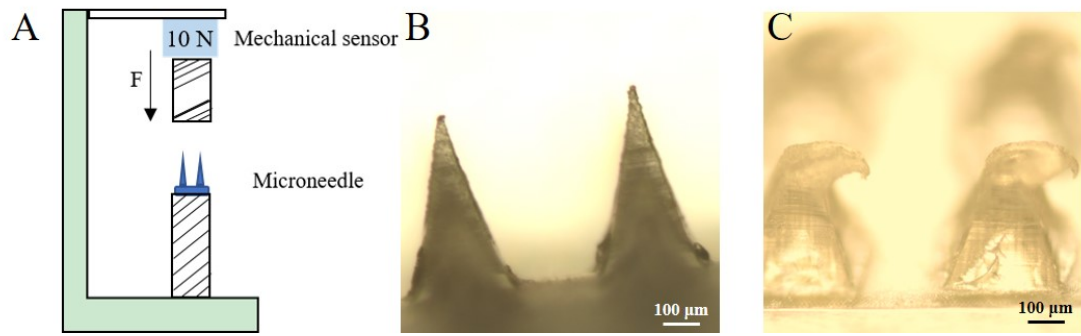
**Figure S1.** Size distribution and zeta potential of the Nap@PLGA in H<sub>2</sub>O.



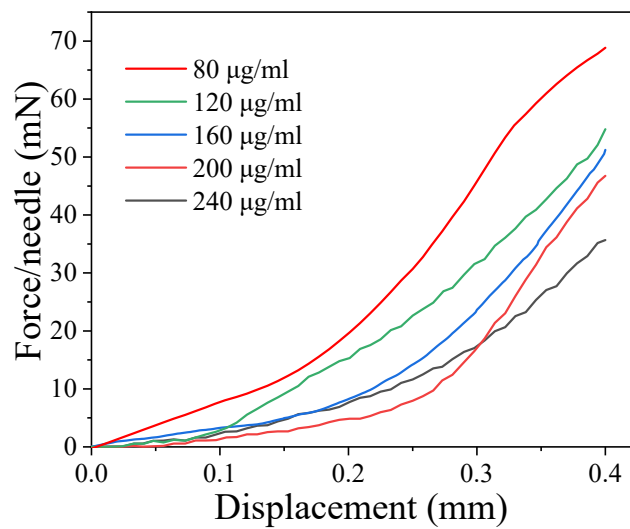
**Figure S2.** Size distribution and zeta potential of the PLGA nanoparticles in H<sub>2</sub>O.



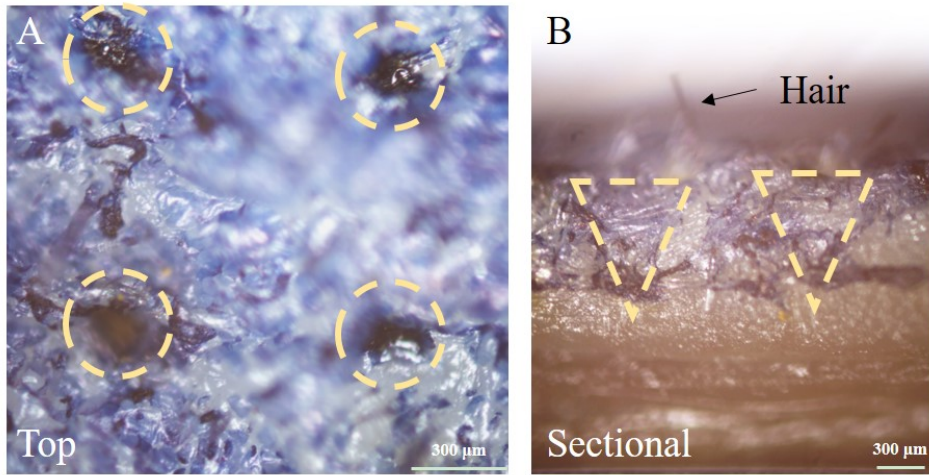
**Figure S3.** The TEM images of PLGA nanoparticles, scale bar is 50 nm.



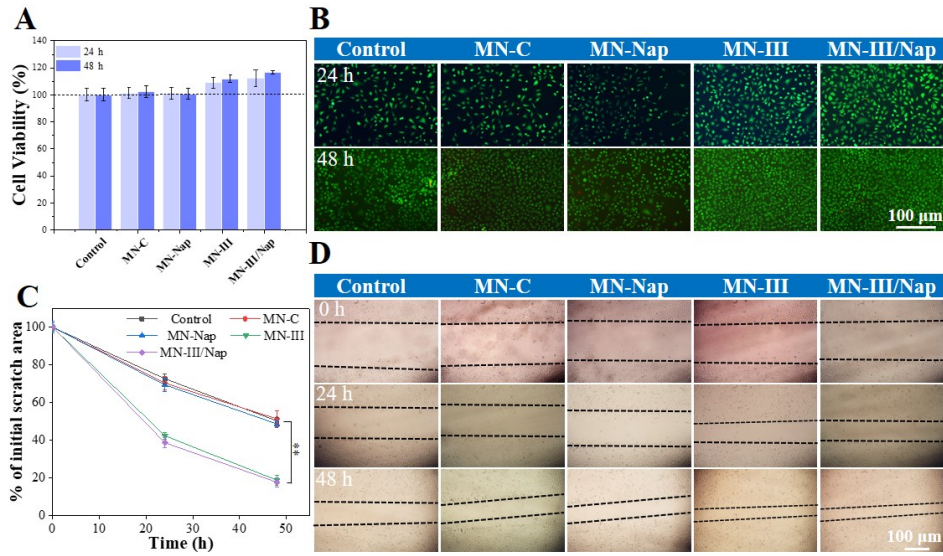
**Figure S4.** (A) Schematic diagram of mechanical performance test of MN. The optical image of MN before (B) and after (C) compression.



**Figure S5.** Mechanical strength of the MN patch with different concentrations of Nap@PLGA nanoparticles



**Figure S6.** The optical micrograph of the mice skin stained with trypan blue after MN-III/Nap application: A) Top; B) Sectional.



**Figure S7.** Cell viability (A) and live/dead staining (B) of HUVECs after incubating with MN solution for 24 h and 48 h. The quantitative analysis (C) and pictures (D) of the cell wound scratch assay of HUVECs at different times. \*P < .01, \*\*P < .001.