

Supporting Information

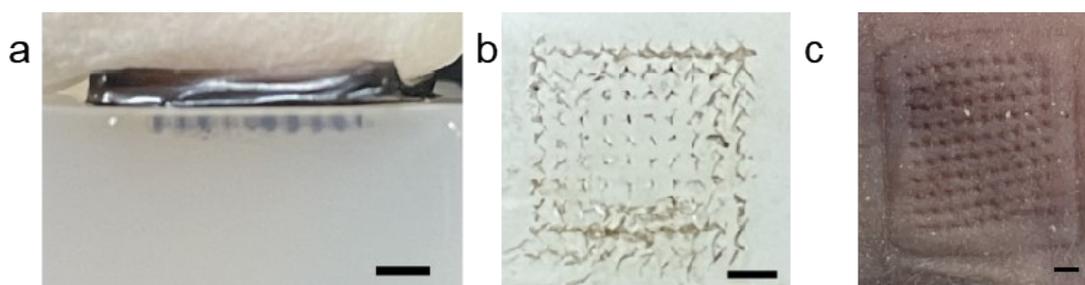


Fig. S1 a) Schematic diagram of the microneedle ascent into the agar surface. b) Image of the agar surface after microneedle puncture. c) Schematic diagram of the skin surface of a nude mouse after microneedle application. Scale bar = 2 mm.

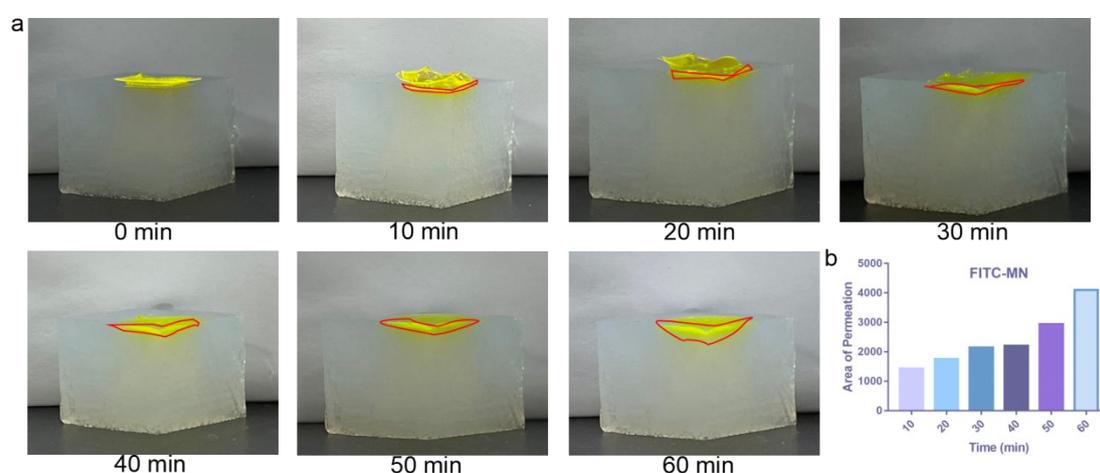


Fig. S2 a) Dissolution of FITC-MN at different time points on the agar surface. b) Proportion of the released area at different time points of FITC-MN.

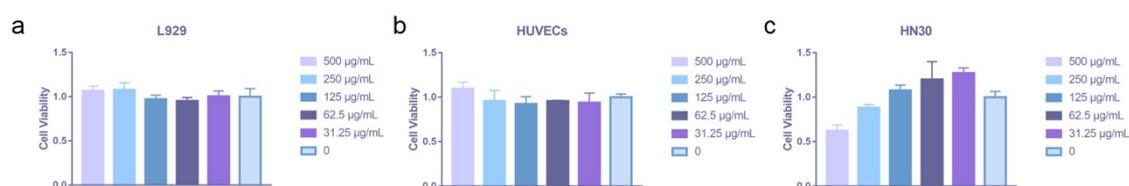


Fig. S3 CCK8 assay results after different cells were treated with different concentrations of Fe₃O₄+VC-MN extract. a) Viability of L929 cells treated with the microneedle extract. b) Viability of HUVECs treated with the microneedle extract. c) Viability of HN30 cells treated with the microneedle extract.

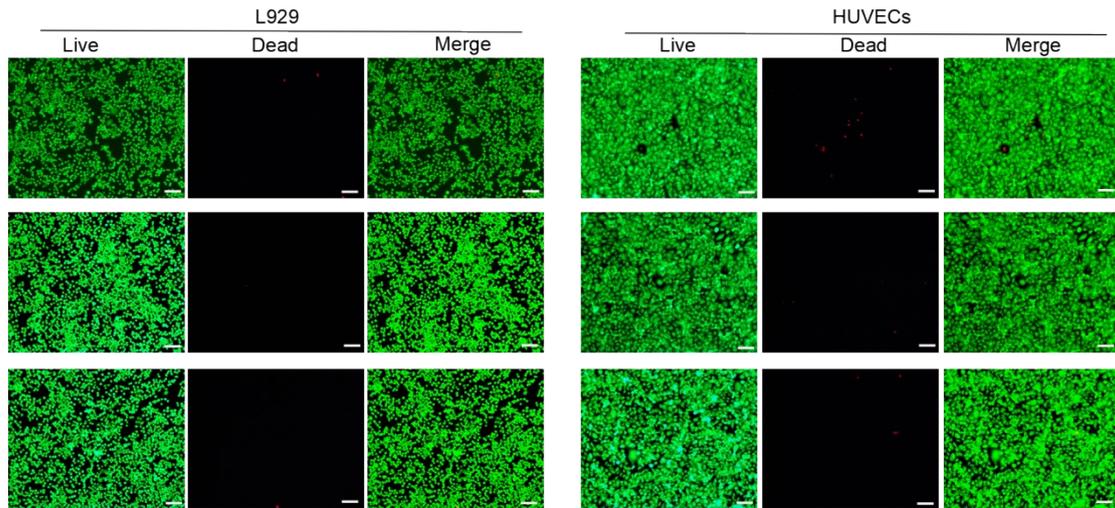


Fig. S4 Dead and alive L929 cells and HUVECs in different groups. Scale bar=200 μm .

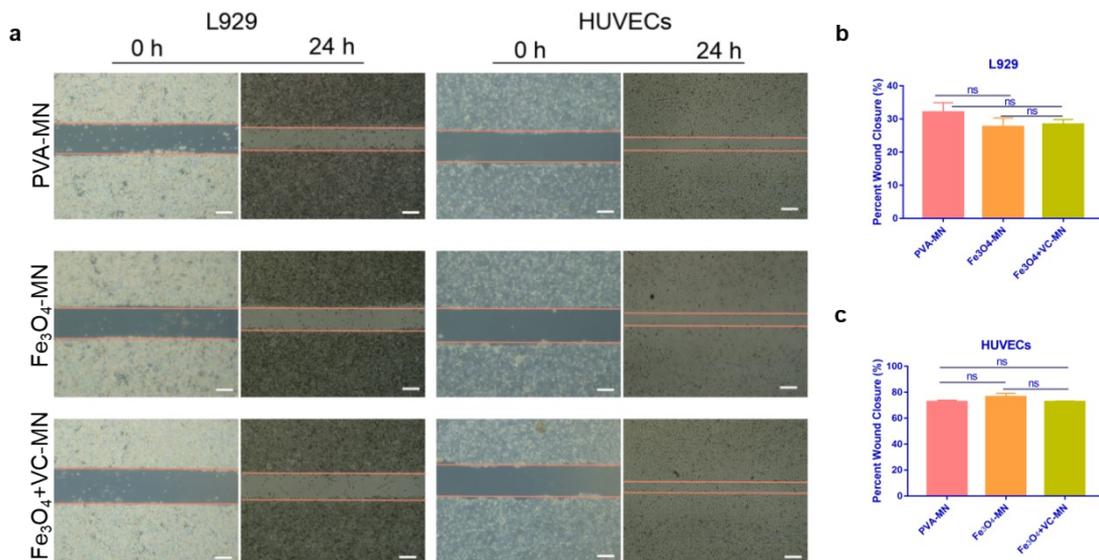


Fig. S5 Cell scratch assay results after different cells were treated with different microneedle extracts. a) Migration of L929 cells and HUVECs after scratching in different groups. b) Proportions of L929 cells in different groups that healed after scratching. c) Proportions of HUVECs in different groups that healed after scratching. Scale bar=200 μm . NS, $p > 0.05$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

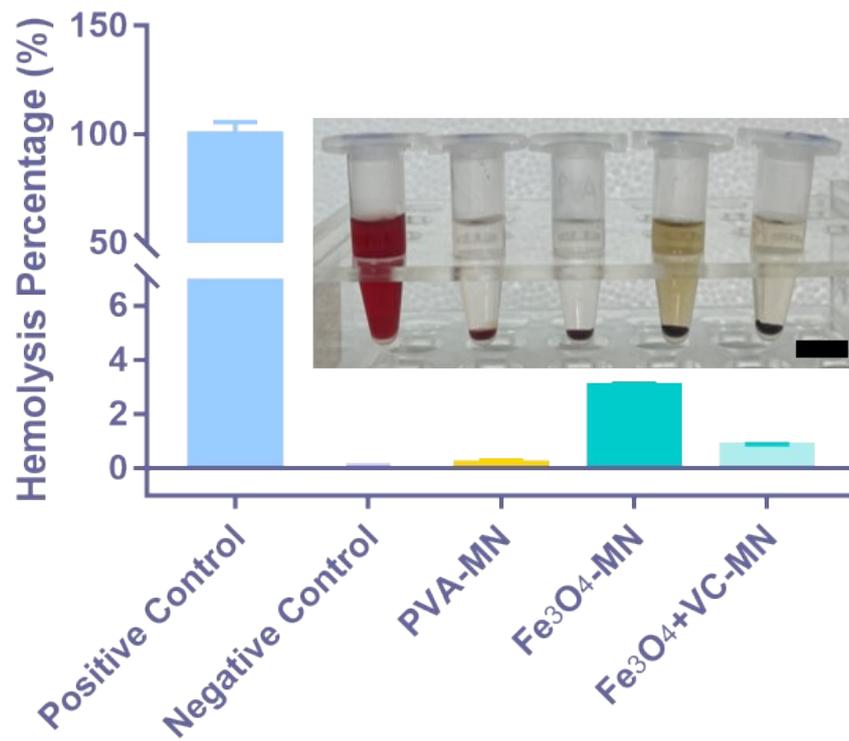


Fig. S6 Hemolysis rates of different groups. Scale bar =1 cm.

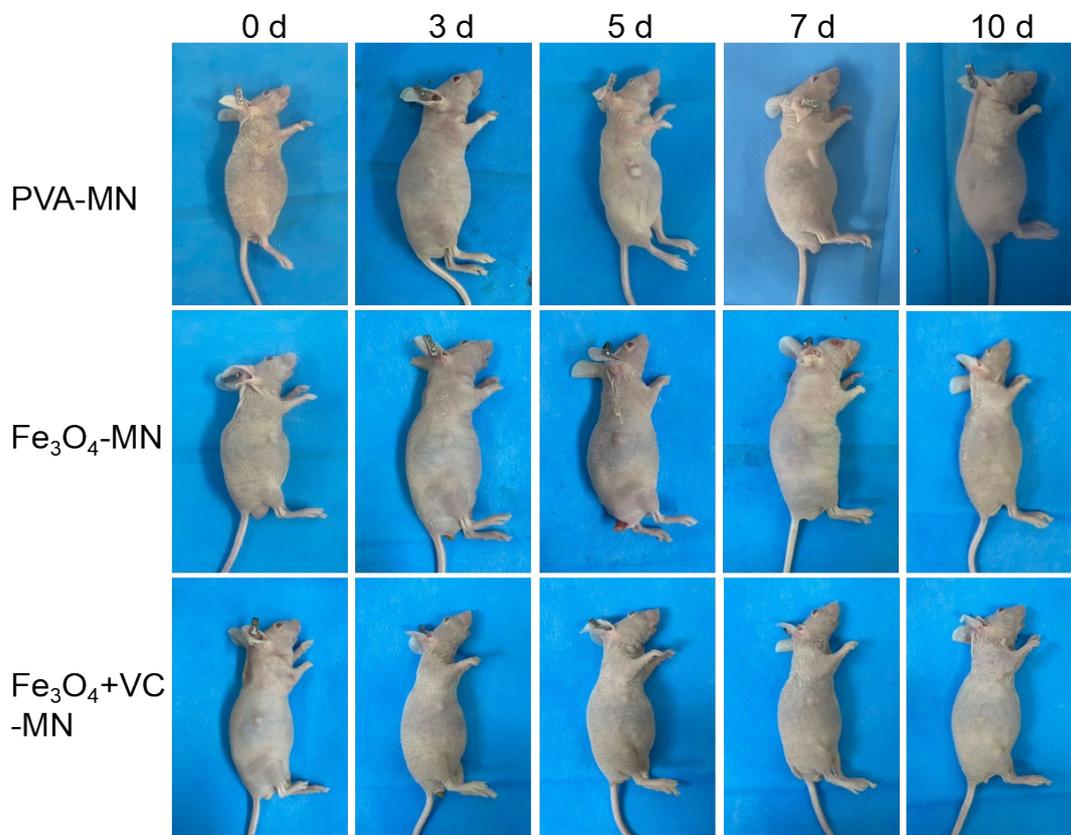


Fig. S7 Full-body photographs of nude mice with tumours in different groups at

different time points.

	Normal Range	PVA-MN	Fe ₃ O ₄ - MN	Fe ₃ O ₄ +VC- MN
RBC	6.36-9.42 (10 ¹² /L)	7.66	9.24	8.85
WBC	0.8-6.8 (10 ⁹ /L)	6.1	6.0	6.7
PLT	450-1590 (10 ⁹ /L)	623	787	841
LYMPH	0.7-5.7 (10 ⁹ /L)	3.5	2.5	2.1
MON	0.0-0.3 (10 ⁹ /L)	0.3	0.4	0.4
HGB	110-143 (g/L)	115	144	128

Table. S1 Routine blood test of nude mice in different groups after treatment for 10 days.