Supplementary Information

Scar prevention through topical delivery of Gelatin-Tyramine-siSPARC nanoplex loaded in dissolvable hyaluronic acid microneedle patch across skin barrier

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Supplementary Experimental Section

RNA Extraction from Formalin-Fixed Paraffin-Embedded (FFPE) tissues and qPCR

Samples embedded in paraffin were extracted and processed via FFPE RNA Purification Kit (Norgen Biotek, Canada) as per the manufacturer's protocol[1]. Extracted RNAs were used for downstream qPCR similar like previously described in section 2.8 of the main manuscript using respective primers (Table S1) to validate SPARC gene silencing.

Table S1. Primers used for qPCR measurement of *In vivo* SPARC silencing study.

Primer Name	Function	Sequence (5'-3')
SPARC	Forward	CGAGACTTTGAGAAGAACTAC
	Reverse	GGACAGGTACCCATCAATAG
TBP	Forward	GCTGGTTATCGGGAGTTGG
	Reverse	ACTGGCCTGGTGTCCTAGAG

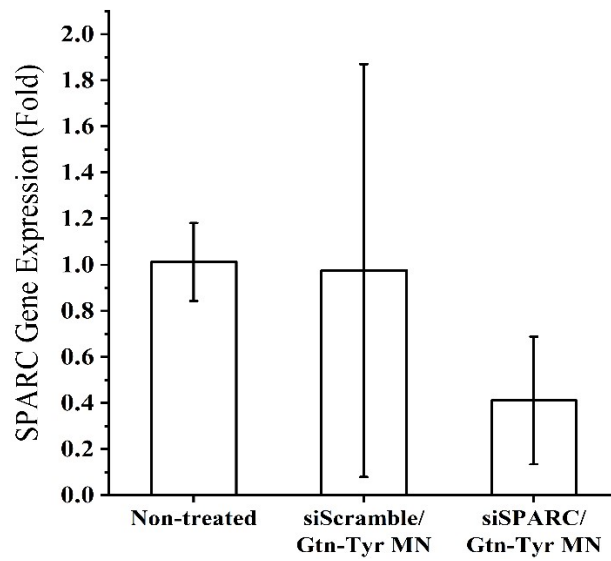**Supplementary Figure**

Fig. S1. Gene expression of SPARC normalized against non-treated wound and housekeeping gene TBP for the mice's skin wound treated with siScramble/Gtn-Tyr nanoplexes-loaded HA microneedle patch (siScramble/Gtn-Tyr MN) or siSPARC/Gtn-Tyr nanoplexes-loaded HA microneedle patch (siSPARC/Gtn-Tyr MN) at day 8.

Reference

1. L. Li, B. J. W. Foo, K. W. Kwok, N. Sakamoto, H. Mukae, K. Izumikawa, S. Mandard, J.-P. Quenot, L. Lagrost and W. K. Teh, *MBio*, 2019, **10**.