Supplementary information

Label-free, ultra-highly sensitive and multiplexed SERS nanoplasmonic biosensor for miRNA detection using head-flocked gold nanopillar †

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I. Supplementary Figures

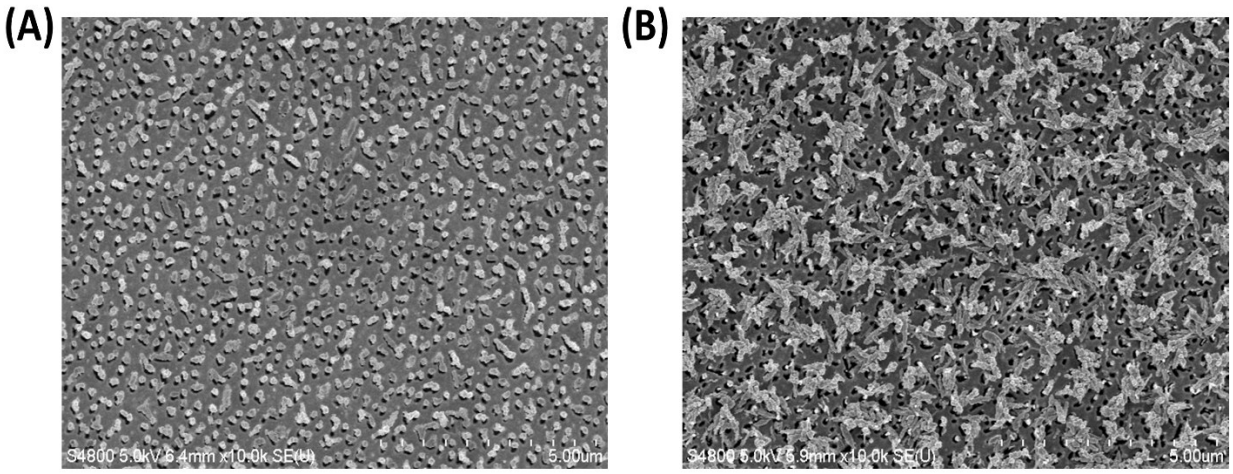

Fig. S1 Fabrication of the head-flocked gold nanopillar SERS substrate: (A) SEM images of the pure structure of the gold nanopillars before sample treatment and (B) SEM images of the transformed structure of the gold nanopillar conjugated with the DNA probe (head-flocked gold nanopillar) after sample treatment.

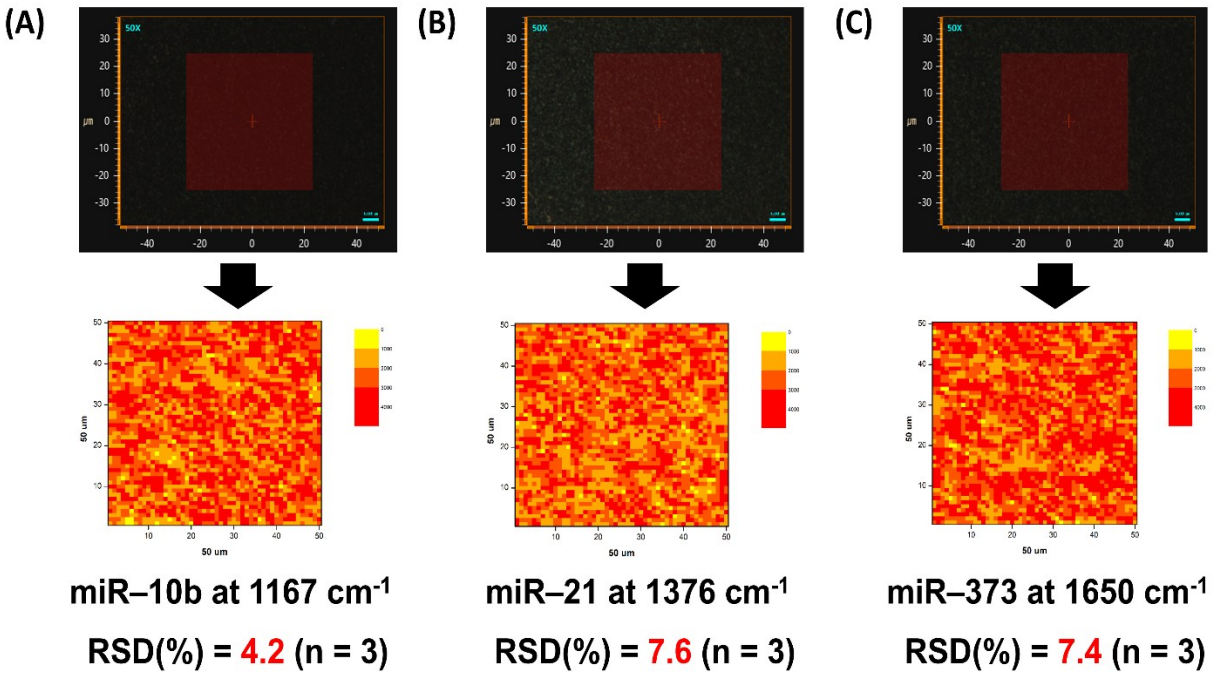

Fig. S2 Signal intensity of Head-flocked gold nanopillar substrates at main peak in 2500 μm^2 mapping area and the relative standard deviation of three different SERS substrates.

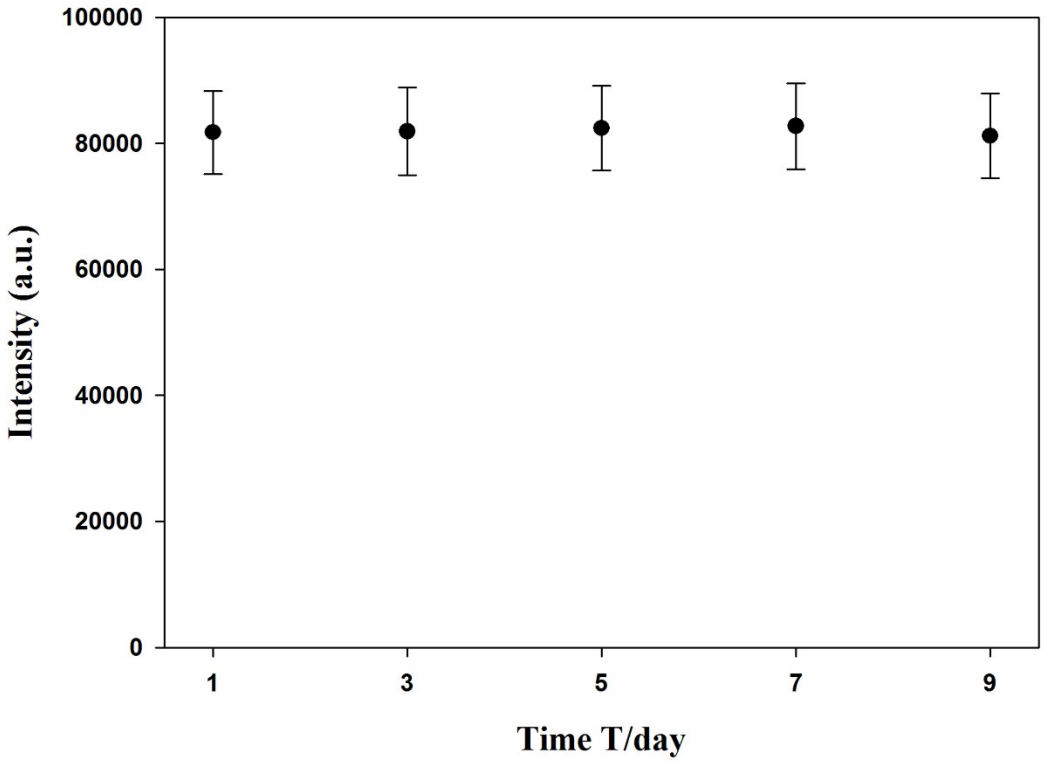

Fig S3. Stability test of the SERS nanoplasmonic biosensor stored in human serum at 30℃ temperature.

Table. S1 Sequence of DNA probes and A, T, G, C ratio

Probe	Sequence	A : T(U) : G :C
miR–10b capture	Thiol-5’ TTCTACAGGGTA 3’	3 : 4 : 3 : 2
miR–10b detection	5’ CACAAATTCGG 3’	4 : 2 : 2 : 3
miR–21 capture	Thiol-5’ CTGATAAGCTA 3’	4 : 3 : 2 : 2
miR–21 detection	5’ TCAACATCAGT 3’	4 : 3 : 1 : 3
miR–373 capture	Thiol-5’ CCATTTTGAGT 3’	2 : 5 : 2 : 2
miR–373 detection	5’ GGAAAGCGCCC 3’	3 : 0 : 4 : 4

Table. S2 The Limit of detection (LOD) comparison between our sensor and other reported ones

Sensor	Limit of detection (LOD)	ref.
qRT-PCR	0.1 nM	S1
Colorimetry	1 pM	S2
SERS	6.3 fM	S3
Fluorescence	0.18 pM	S4
Electrochemistry	10 fM	S5
Our sensor	2 ~ 4 fM	-

Reference

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S3. H. Zhang, Liu, Y., J. Gao, J. H. Zhen, *Chem. Commun.* 2015, **94**, 16836-16839.

S4. L. R. Zhang, G. C. Zhu, C. Y. Zhang, *Anal. Chem.* 2014, **86**, 6703−6709.

S5. Y. Cheng, J. P. Lei, Y. L. Chen, H. X. Ju, *Biosens. Bioelectron*. 2014, **51**, 431-436.