Supplementary Information (SI) for RSC Advances.
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Supplementary Materials:

Development of a Point-of-Care-Testing Platform: Localized Surface Plasmon Resonance Biosensor for Rapid ABO/Rh Blood Typing

Pengcheng Wang [1, &], Yan Chen [2, &], Mingdi He [3, &], Yan Ma [3], Jiang Zhu [1], Yunhuang Yang [1] and Rui Hu [1, *]

1. State Key Laboratory of Magnetic Resonance Spectroscopy and Imaging, Innovation Academy for Precision Measurement Science and Technology, Chinese Academy of Sciences - Wuhan National Laboratory for Optoelectronics, Huazhong University of Science and Technology, Wuhan 430071, China;
2. Wuhan Fourth Hospital, Wuhan 430030, China.;
3. Wuhan Blood Center, Wuhan 430030, China.;
& These authors contributed equally to this work and should be considered co-first authors;
* Correspondence: hurui@apm.ac.cn

17 Table S1. LSPR sensitivity performances of gold NPs after exposure to different RI environments

Sample		air (n=1)	dd-water (n=1.33)	acetone (n=1.36)	chloroform (n=1.44)
Gold	Wavelength/nm	548.82±0.46	561.88±0.70	568.17±0.80	575.23±3.06
Nps	S, nm/RIU[a]	-	39.56	209.81	88.275

18 Note: [a]S, nm/RIU=$\triangle \lambda_{max}/\triangle$RI, and the $\triangle \lambda_{max}$ is the shift of maximum resonant wavelength.

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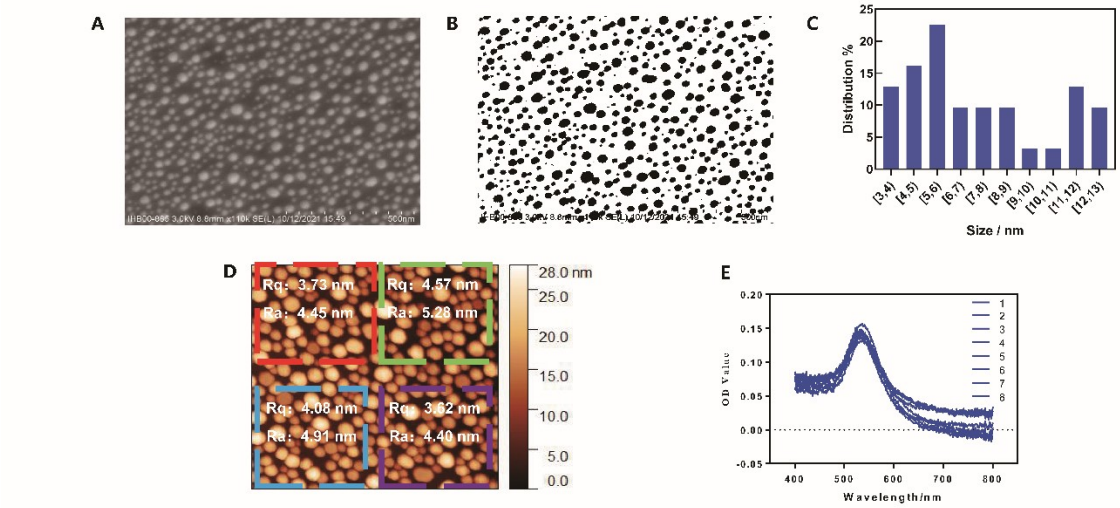


Fig. S1 （A）SEM image of gold NPs, (B) The processing and analysis procedure performed by “Analyze Particle” tool implemented in ImageJ software allows to decompose the objects in black dots morphological information such as particle diameter distribution, (C) the gold NPs diameter distribution, (D) gold NPs AFM images and calculated Rq & Ra, (E) LSPR spectra of gold NPs (n=8).

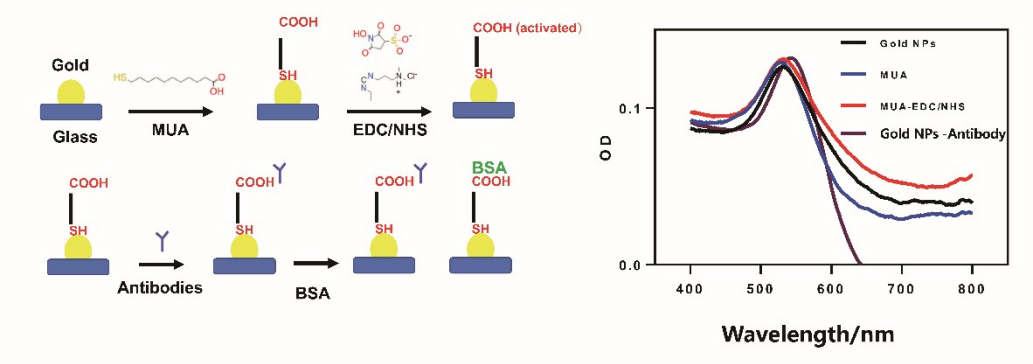


Fig. S2 Overview of the step involved in the gold NPs bio-function (left) and LSPR spectra of gold NPs of each bio function (right).

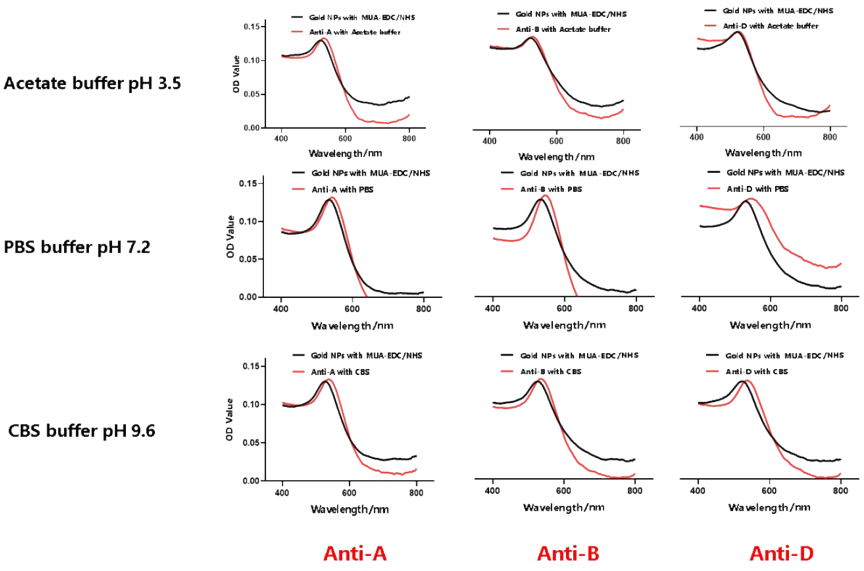
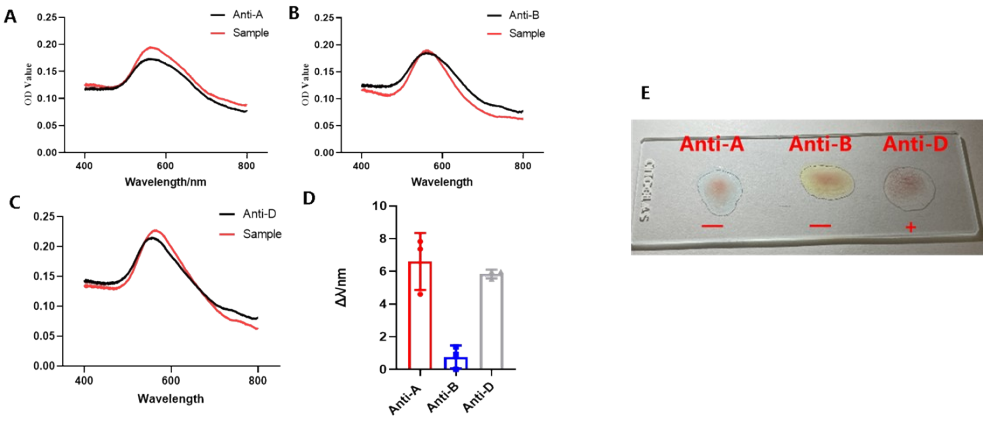


Fig. S3 LSPR spectra of gold NPs when different reaction buffer to biofunction.



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35 Fig. S4 (A-C) LSPR spectra of blood samples from leukaemia patients. (D) LSPR
36 red-shift showing the on-chip testing results of the leukaemia patient sample., (E)
37 Result of regular method to analysis leukaemia patient blood type.

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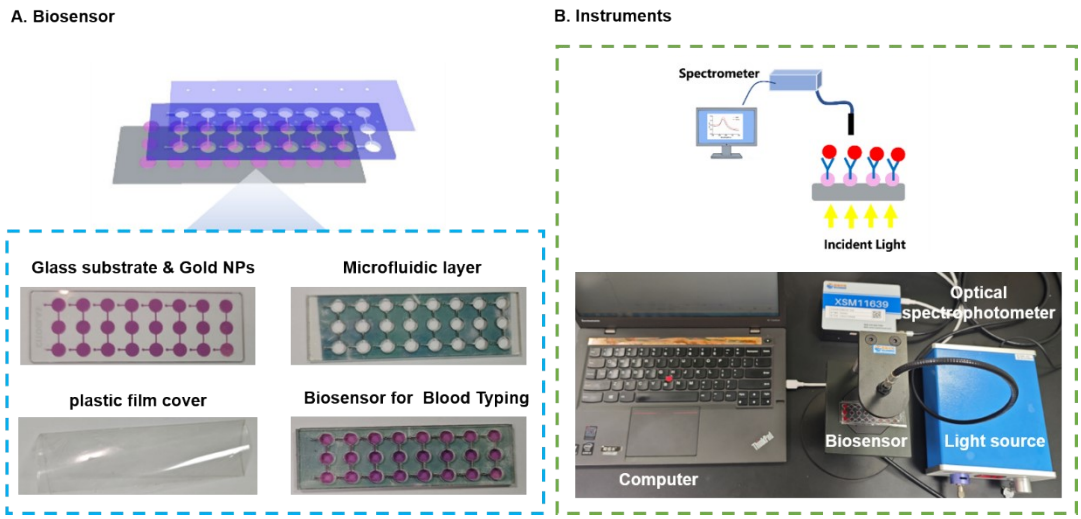

Fig. S6 Image of fabricated LSPR biosensor and testing instrument system

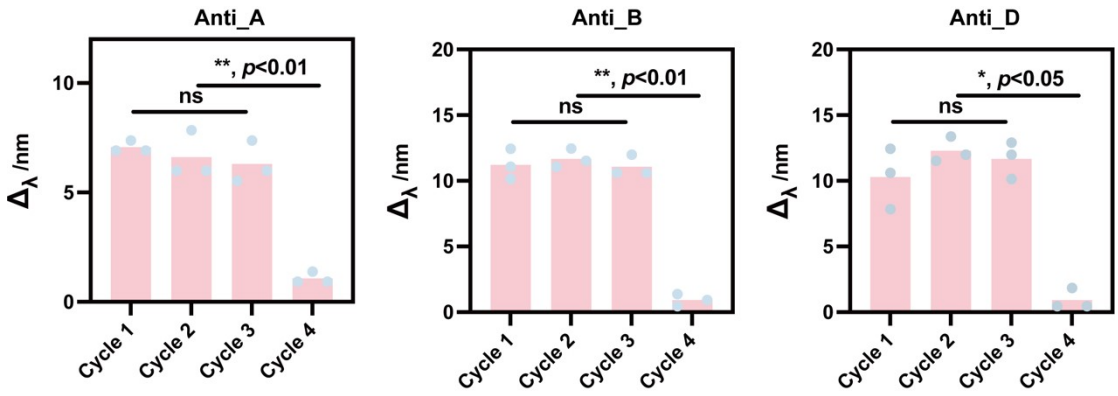

Fig. S6. LSPR biosensor platform's repeatability and cycling tests. ** $p < 0.01$; * $p < 0.05$, (t test and Nonparametric Tests)

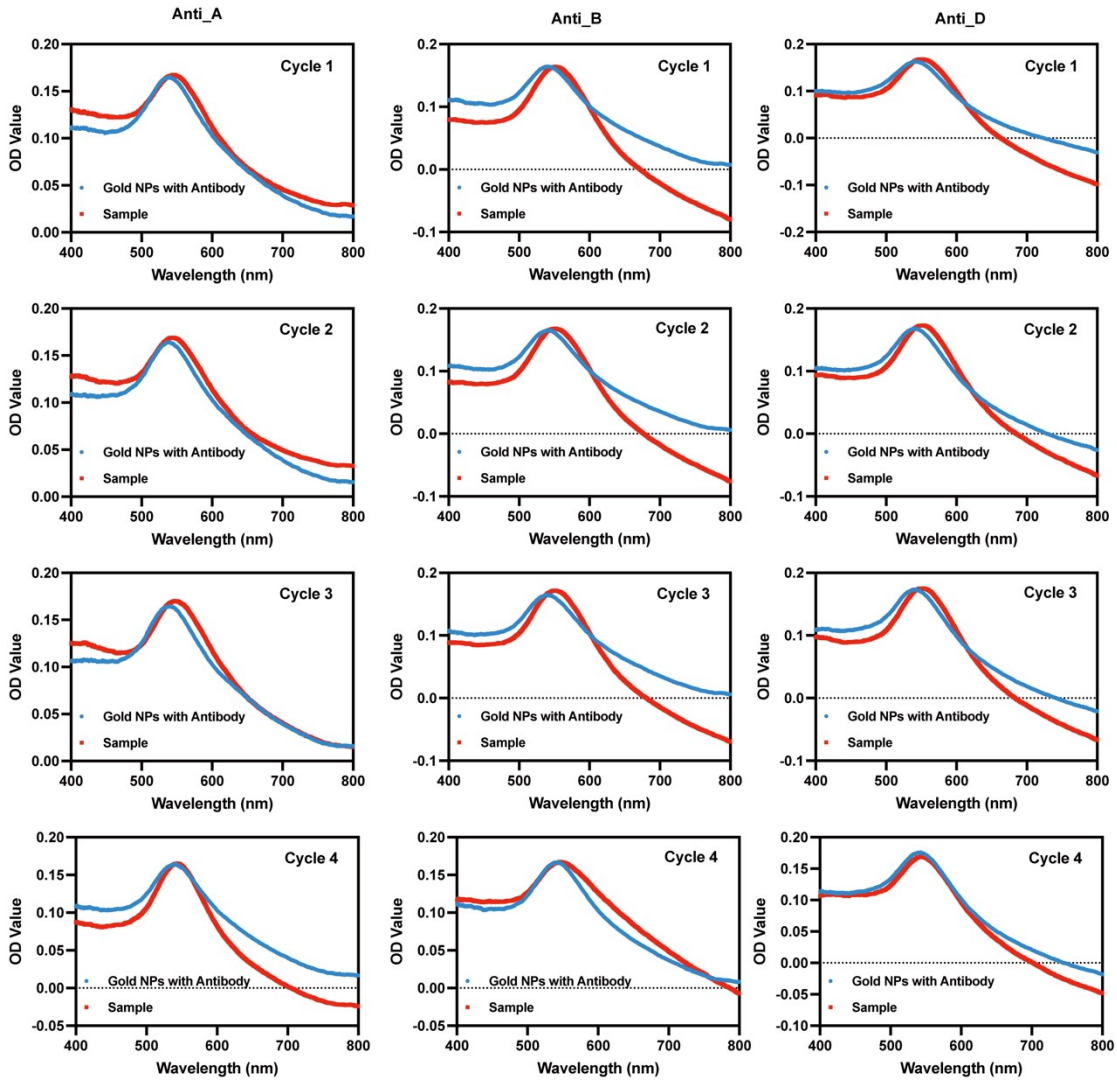

Fig. S7. LSPR spectra of biosensor platform's repeatability and cycling

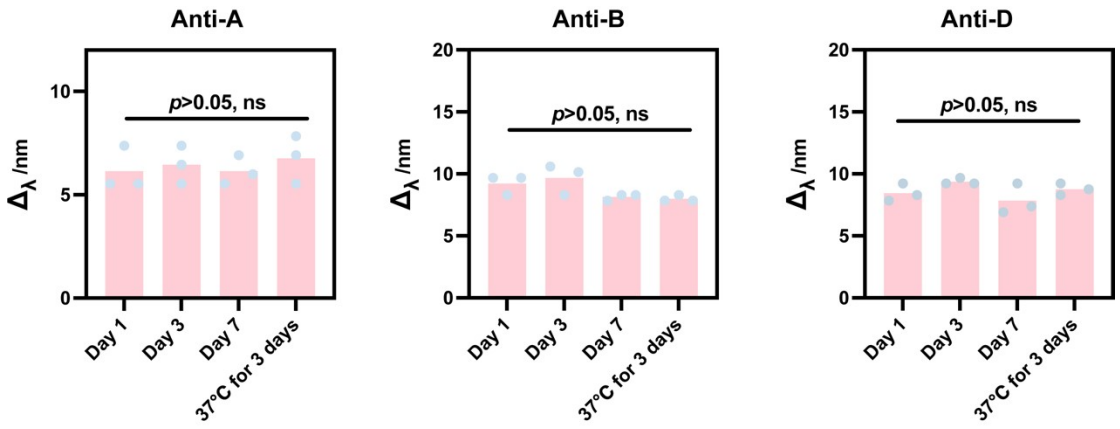

Fig. S8. LSPR biosensor platform's long-term stability tests. ** $p < 0.01$; * $p < 0.05$, (t test and Nonparametric Tests)

55 Table S2 Comparison with existing blood typing technologies

Blood typing technologies	Cost	POCT	Operational complexity	Detection time/min	High-through out	Accuracy rate/%	Reference
Paper-based assay	-	Yes	Easy	10	No	More than85%	[31]
Gel agglutination assay	-	No	Complicated	15-25	No	Nearly 100%	[32]
Present method	0.5$	Yes	Easy	10-20	Yes	More than 90%	-

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