Supplementary materials

Plasma enhanced label-free immunoassay for alpha-fetoprotein based on a U-bent fiber-optic LSPR biosensor

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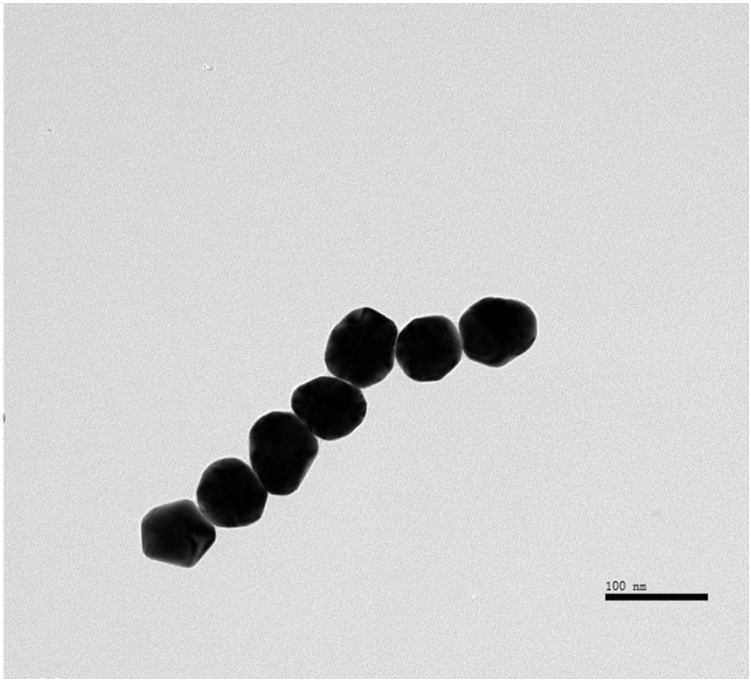
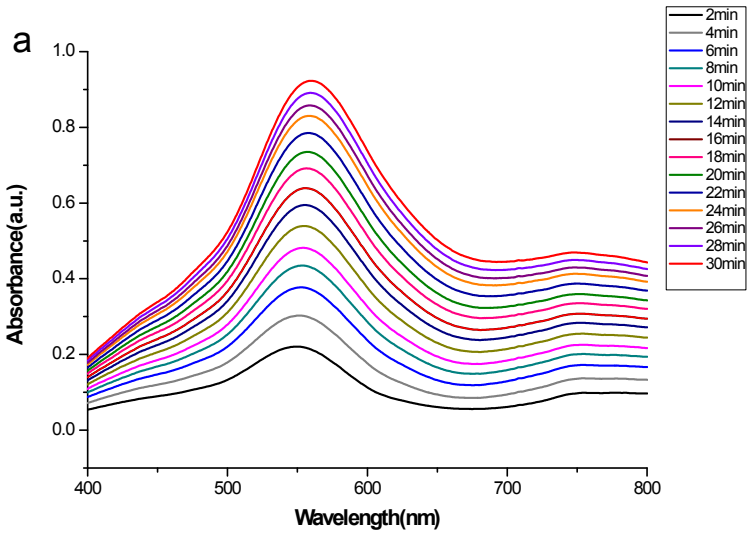


Fig. S1. Transmission electron microscopy (TEM) image of the synthesized gold nanoparticles



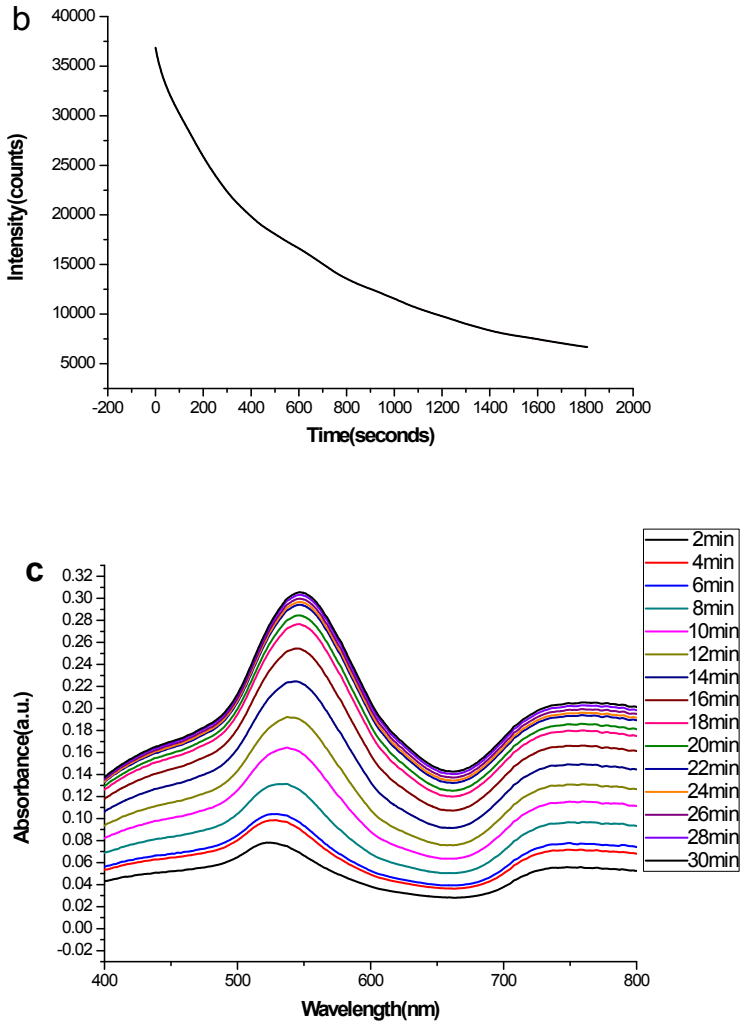


Fig. S2. (a) Absorbance spectrum of the GNP bound to U-bend fiber optic probe with plasma pretreatment (the assembly time corresponds to the absorbance spectrum from the bottom to the top). (b) Real-time light intensity response was observed at 550 nm. (c) Absorbance spectrum of the GNP bound to the U-bend fiber optic probe without plasma pretreatment.

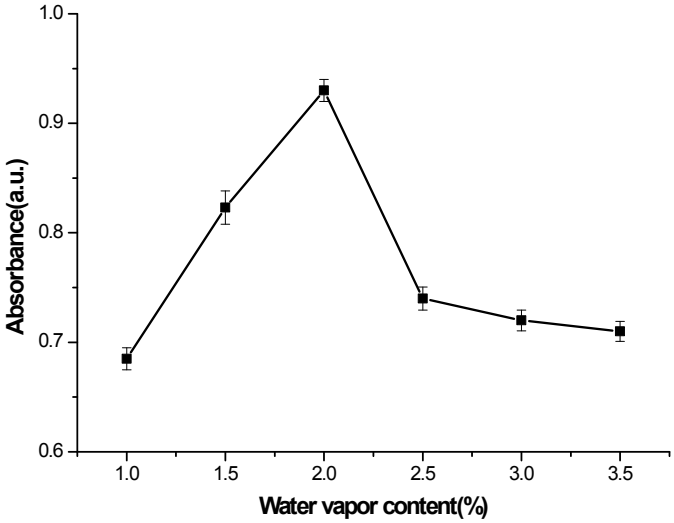


Fig. S3. The optimal experiment about the H_2O/Ar gas mixture ratio: the absorbance obtained from GNPs coated U-bend fiber optic probe with different water vapor content H_2O/Ar plasma pretreatment.

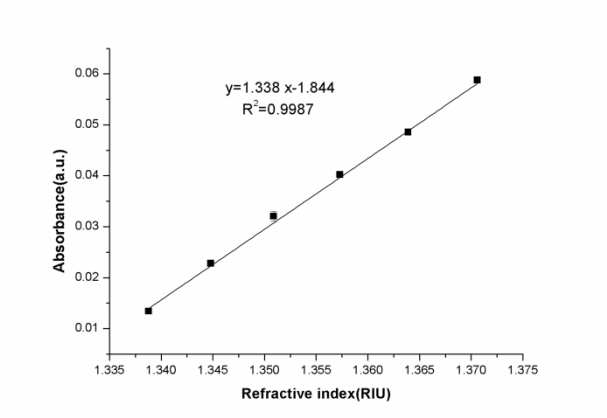


Fig. S4. Absorbance changes obtained with straight fiber probes (4 cm probe length, 600 μm core diameter and a numerical aperture (NA) of 0.37) for the different sucrose solutions.

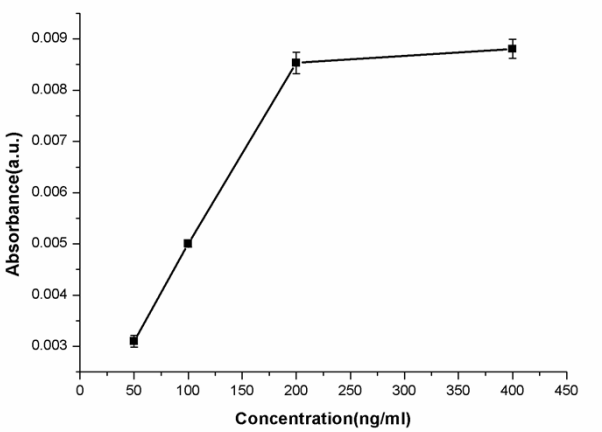


Fig. S5. Relationship between the AFP concentration in PBS versus the normalized absorbance signal (n=3).

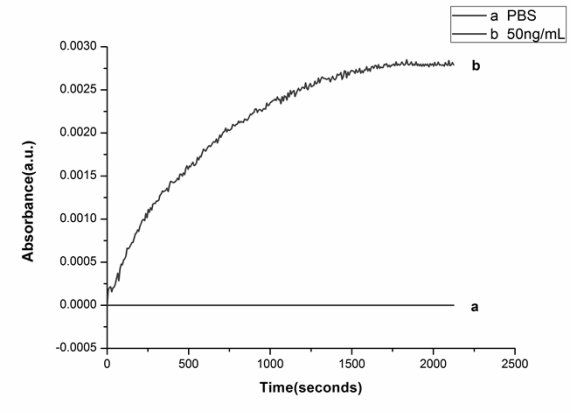


Fig. S6. (a) Baseline response of AFP immobilized probe immersed in PBS buffer. (b) Real-time absorbance changes at 584 nm during the binding of 50 ng/mL AFP-anti AFP.

Table 1 Comparison of the results obtained with the proposed method and other methods for AFP detection

Analytical method	Sample	LOD	Linear range	Reference
Fluoroimmunoassay	Serum	11.2 ng/mL	/	10
RIA	Serum	0.66 ng/mL	/	11
ELISA	Serum	9.2 ng/mL		15
Electrochemical Immunosensor	Serum	0.81 ng/mL	1-500 ng/mL	12
LSPCF	PBS	/	0.1-100 ng/mL	40
	Serum	/	2.33-143.74 ng/mL	
Gold Nanorods-based LSPR Biosensor	PBS	16.5 ng/mL	16.5 ng/mL-943.8 ng/mL	16
Plasma-enhanced LSPR biosensor	PBS	0.85 ng/mL	5-200 ng/mL	
	Serum	3.3 ng/mL	5-200 ng/mL	