Supporting Information

A Visual Distance-Based Capillary Immunoassay Using Biomimetic Polymer Nanoparticles for Highly Sensitive and Specific C-Reactive Protein Quantification

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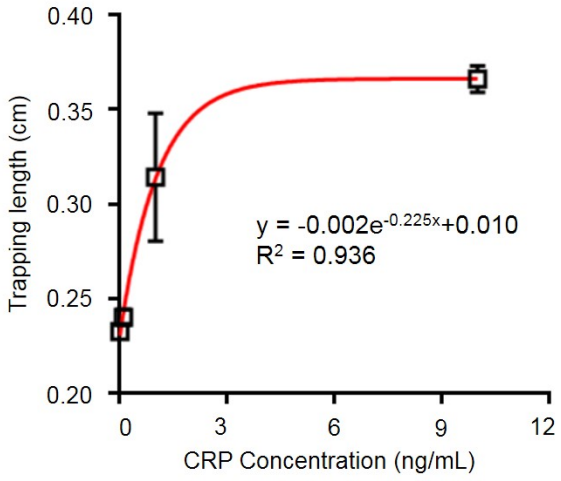


Figure S1. The correlation between the lower CRP concentrations (0-10 ng/mL) and the length of visually quantifiable strip in glass capillary tubes.



Figure S2. The representative images of the visually quantifiable strip in glass capillary tubes for specificity experiments. The scale bar is 2 mm.

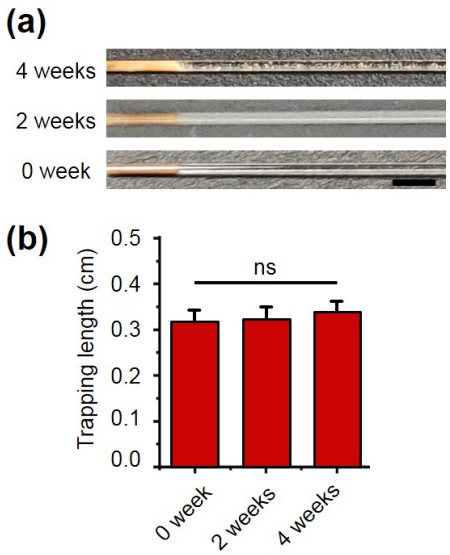


Figure S3. (a) The images of the visually quantifiable strip in glass capillary tubes using the synthesized PMPC and magnetic NPs after different storage periods for detecting CRP (1 ng/mL). The scale bar is 2 mm. (b) Quantified distance of visual strips in the glass chips.

Table S1. The comparation of measured results using both the developed assay and a commercial ELISA kit.

Sample	The standard concentration	Measured concentration using this assay	Measured concentration using ELISA
#1	10 ng/mL	9.4 ± 0.7 ng/mL (RSD=7.4%)	10.5 ± 0.6 ng/mL (RSD=5.7%)
#2	100 ng/mL	101 ± 3.1 ng/mL (RSD=3.1%)	103 ± 2.8 ng/mL (RSD=2.7%)
#3	10 μg/mL	10.2 ± 0.4 μg/mL (RSD=3.9%)	9.6 ± 0.2 μg/mL (RSD=2.1%)

Table S2. Comparison of the proposed CRP detection assay with previous reports.

Methods	**Limit of detection**	**Detection range**	**Quantification equipment**	**Visual quantification**	**Ref.**
Dual electrochemical magnetoimmunosensor	8 ng/mL	10 – 5,000 ng/mL	Electrochemical workstation	×	[1]
Paper-based electrochemical sensor	1.6 ng/mL	5 – 5000 ng/mL	Electrochemical workstation	×	[2]
Fluorescence polarization immunoassay	207 ng/mL	20000 – 100,000 ng/mL	Fluorescent imaging	×	[3]
Bio/chemical hybrid sensing system	10 pM	10-1000 pM	PMPC-grafted-plasmonic chips	×	[4]
Hydrogel-based label-free biosensor	0.3 mg/L	0.3-50 mg/L	Diffraction measurements	×	[5]
Immunochromatographic strips and gas	0.041 ng/mL	0.05 - 6.25 ng/mL	Microfabricated glass	√	[6]

generation biosensors			microfluidic chips		
Lateral flow immunoassays and AuNPs	100 ng/mL	100 – 5,000 ng/mL	Color or fluorescent imaging	√	[7]
PMPC-based distance assay	57.5 pg/mL	0.1 – 5,000 ng/mL	Affordable glass capillaries	√	This work

References

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