

## Enzyme-free and Highly Sensitive Detection of Human Epidermal Growth Factor-2 Based on the MNAzyme Signal Amplification in Breast Cancer

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**Table S1.** The DNA sequences used in this work.

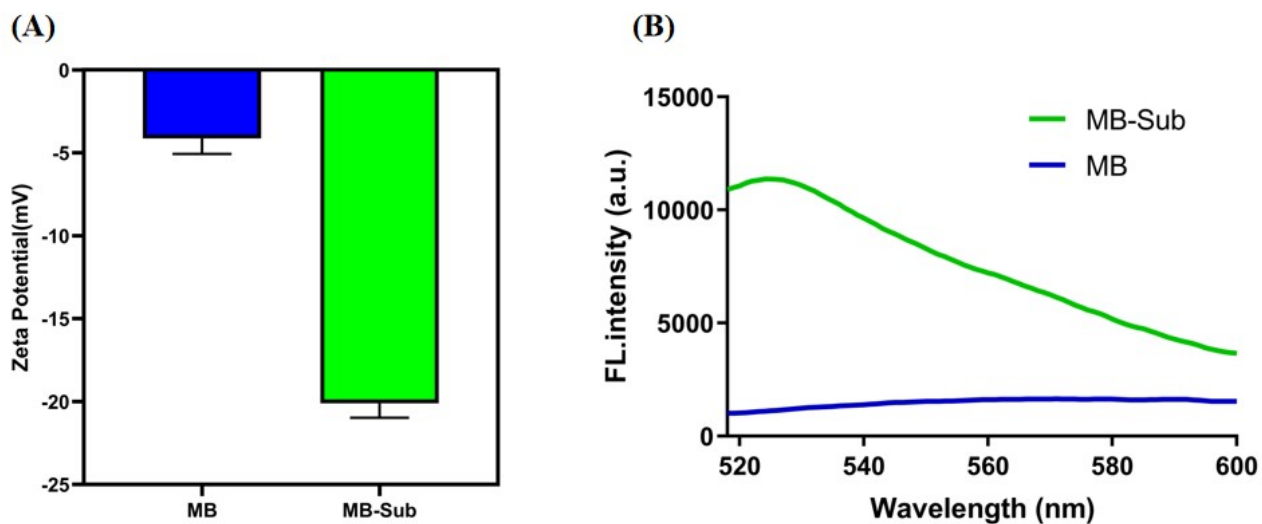
<b>Name</b>	<b>Sequence (5'-3')</b>
HER2 Aptamer	AATTAAGCCGCGAGGGGAGGGATAGGGTAGGGCGCGGCT
cDNA	CGGCGCTCCCCTCCCTATCCCATCCCG
Partzyme A	CAGTCAGAGGCTAGCTGAGGGGAGCGCCG
Partzyme B	CGGGATGGGATAGGACAACGAGGTCCATG
Substrate	Biotin- TTTTTTTTTTTTTTTTTTTTTTCATGGACCrGrUCTGACTGTTTTTTTTTT-FAM

**Table S2.** Comparison of different biosensors for the detection of HER2.

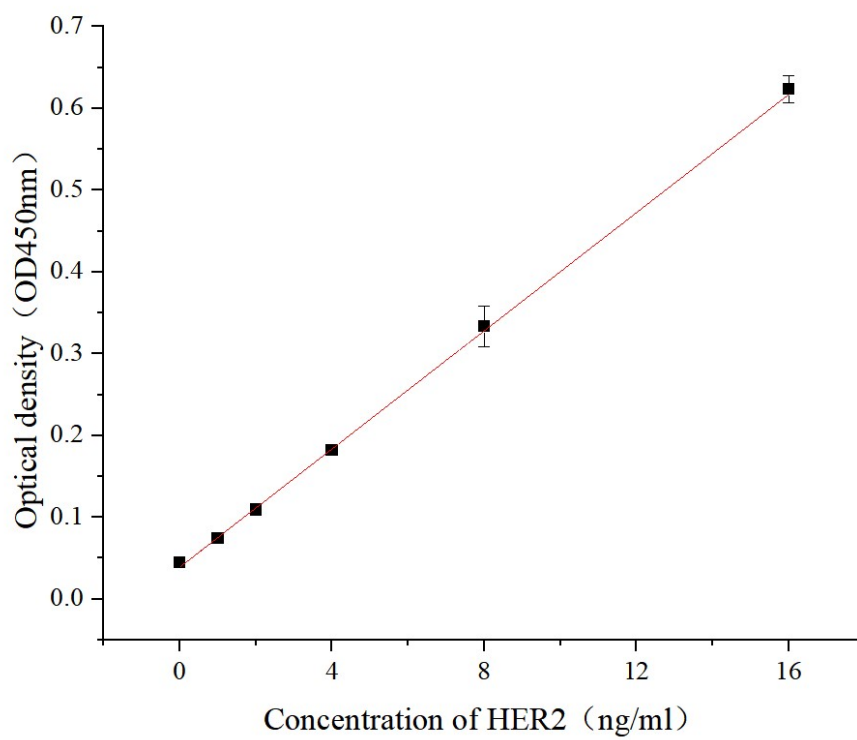
Type of sensors/Method	Time	Detection limit	Linear range	Standard method	Ref.
Electrochemical/Reduced graphene oxide-chitosan-aptamer interface	3 hours	0.21 ng/mL	0.5-2 ng/mL and 2-75 ng/mL	ELISA	[1]
Electrochemical/A HER2 specific peptide immobilized onto a gold electrode surface	> 10 hours	0.047 pg/ mL	1-100 pg/mL	No	[2]
Electrochemical/A sandwich-type electrochemical immunosensor based on in situ silver deposition	123 min	$2.0 \times 10^{-5}$ ng/mL	$5.0 \times 10^{-4}$ -50.0 ng/mL	ELISA	[3]
Electrochemical/Based on 3,4-ethylenedioxythiophene (PEDOT) and a biocompatible peptide hydrogel	> 12 hours	45 pg/mL	0.1 ng/mL-1.0 $\mu$ g/mL	ELISA	[4]
Fluorescence/ Based on the proximity of G-rich sequences to Ag nanoclusters	160 min	0.0904 fM	8.5-340 fM	ELISA	[5]
Fluorescence/Near-infrared MnCuInS/ZnS@BSA and urchin-like AuNP as a novel donor-acceptor pair	2 hours	1 ng/mL	2-100 ng/ml	ELISA	[6]
Fluorescence/Three-dimensional DNA walker	190 min	0.01 ng/mL	0.5-5 ng/mL	No	[7]
Fluorescence/The MNAzyme Signal Amplification	3 hours	0.02 ng/mL	0.5-100 ng/mL	ELISA	This work

**Table S3.** Recoveries of HER2 in spiked serum samples from healthy people.

<b>Sample</b>	<b>Added (ng/mL)</b>	<b>Determined (ng/mL)</b>	<b>RSD</b>	<b>Recovery (%)</b>
1	0	0.73 ± 0.11	0.150	~
2	0.5	0.56 ± 0.02	0.035	112.0
3	1	1.08 ± 0.09	0.083	108.0
4	5	4.93 ± 0.23	0.047	98.6
5	10	10.44 ± 0.32	0.031	104.4



**Figure S1.** The characterization of DNA-functionalized streptavidin magnetic beads. **(A)** Zeta potential analysis before and after substrate modification of magnetic beads. (MB: streptavidin magnetic beads, MB-Sub: Substrate-functionalized streptavidin magnetic beads) **(B)** The fluorescent spectra of streptavidin magnetic beads (MB) and DNA-functionalized streptavidin magnetic beads (MB-Sub).



**Figure S2.** The calibration curve obtained by commercial ELISA kit.

## References.

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