Simultaneous detection of breast cancer biomarkers HER2 and miRNA-21 based on duplex-specific nuclease signal amplification

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Contents

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

NAME	Sequence（5'-3'）
HER2 aptamer	GCAGCGGTGTGGGG
DNA1	Biotin-AAAAAAAAAAAAAAAAAAAAATCAACATCAGTCTGATAAGCTAAAAAAAAAAAA-Cy5
DNA 2	Biotin-AAAAAAAAAAAAAAAAAAAACCACACCGCTGCAAAAAAAAAAAAAA-FAM
miRNA-21	UAGCUUAUCAGACUGAUGUUGA
miRNA-122	UGGAGUGUGACAAUGGUGUUUG
miRNA-96	UUUGGCACUAGCACAUUUUUGCU
miRNA-141	UAACACUGUCUGGUAAAGAUGG
Single-base mismatch (SM)	UAGCUUAUCG̲GACUGAUGUUGA
Double-base mismatch (DM)	UAA̲CUUAUCG̲GACUGAUGUUGA
Three-base mismatch (TM)	UC̲GCUUAUCG̲GACUGAUC̲UUGA
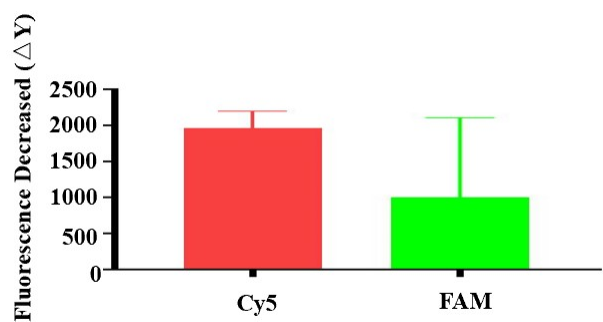
Fig.S1. After magnetic beads modified fluorescence, the fluorescence of Cy5 and FAM decreased in the modified solution. The data error bars indicate mean ± SD (n=3).
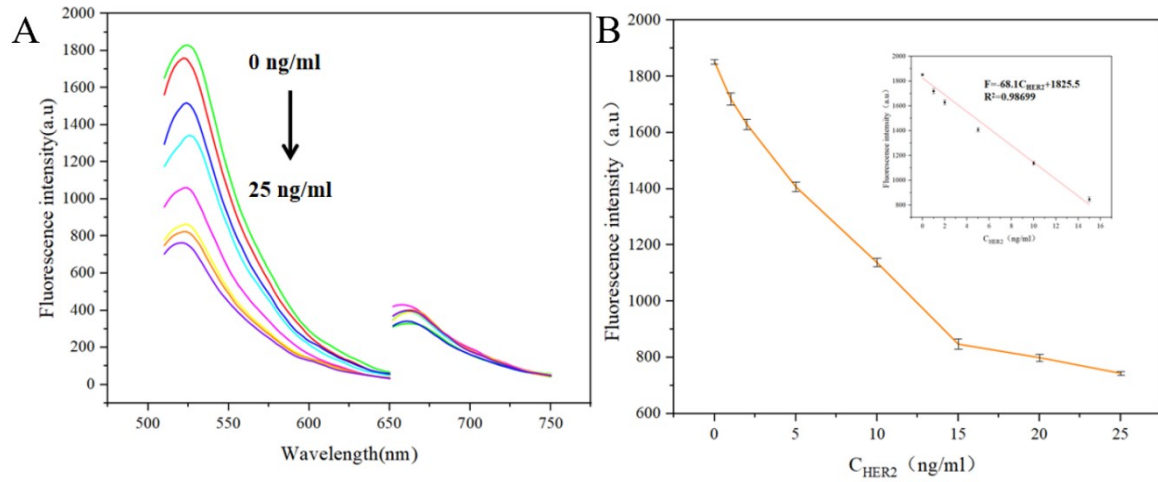
Fig.S2. Individual sensitivity detection of HER2 protein. (A)Fluorescence spectra obtained by detecting different concentrations of HER2 protein. (B) Linear relationship between fluorescence intensity and HER2 concentration. The data error bars indicate mean ± SD (n=3)
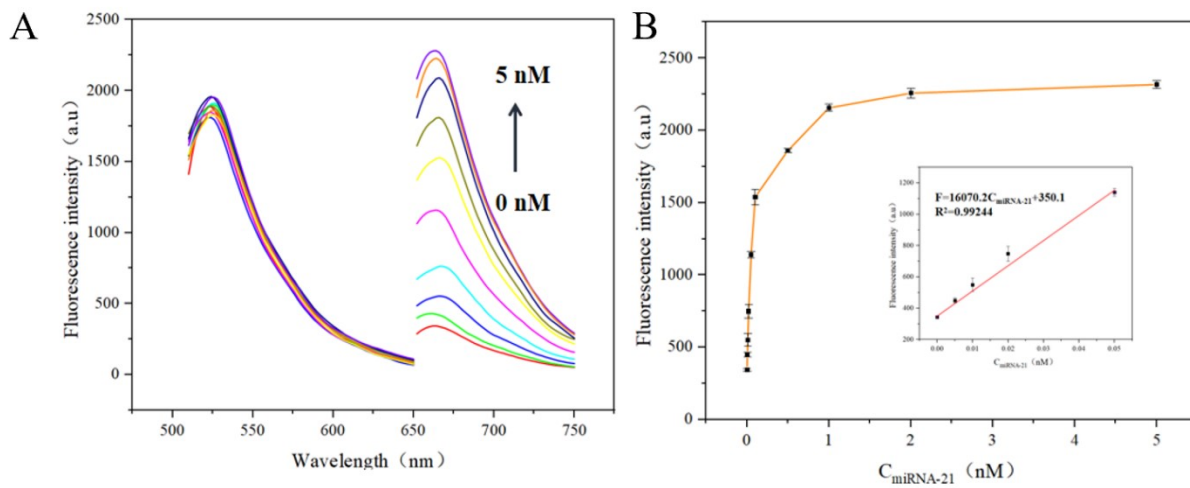
Fig.S3. Individual sensitivity detection of miRNA-21. （A) Fluorescence spectra obtained by detecting different concentrations of miRNA-21. (B) Linear relationship between fluorescence intensity and miRNA-21 concentration. The data error bars indicate mean ± SD (n=3)

Sample	Added	Determined	RSD	Recovery （%）
1 HER2	1 ng/mL	1.11±0.07 ng/mL	0.063	111
miRNA-21	1 pM	1.03±0.03 pM	0.029	103
2 HER2	2 ng/mL	1.96±0.12 ng/mL	0.061	98.0
miRNA-21	5 pM	5.13±0.27 pM	0.053	102.6
3 HER2	5 ng/mL	4.87±0.14 ng/mL	0.029	97.4
miRNA-21	10 pM	10.31±0.42 pM	0.041	103.1
4 HER2	10 ng/mL	10.54±0.61 ng/mL	0.058	105.4
miRNA-21	20 pM	19.76±0.31 pM	0.016	98.8

Table S2. Recovery of HER2 and miRNA-21 in serum of healthy people with different concentrations.

CRediT authorship contribution statement

Miao He, Zhiqiang Hou: Conceptualization, Methodology, Software, Investigation, Validation, Data curation, Writing-original draft. Feifan Yin: Investigation. Wenting Cheng: Validation, Investigation. Zhongyun Wang: Resources, Supervision. Yang Xiang: Conceptualization, Methodology, Review & editing, Supervision, Funding acquisition. All authors have given approval to the final version of the manuscript.