

Supporting Information

Functionalized magnetic nanoparticles regulated CRISPR-Cas12a sensor for ultrasensitive detection of alpha-fetoprotein

Ya Liu,^a Yan Chen,^a Yue Zhang,^b Qi Zhong,^{*a} Xiaoli Zhu ^{*a} and Qi Wu ^{*a,c}

^aDepartment of Clinical Laboratory, Shanghai Tenth People's Hospital, Tongji
University School of Medicine, Shanghai 200072, China.

^bDepartment of Central Laboratory, Shanghai Tenth People's Hospital of Tongji
University, Shanghai, 200072, China.

^cDepartment of Clinical Laboratory, Shanghai Tenth People's Hospital Chong Ming
Branch, 202150, China.

*Corresponding authors:

E-mail addresses: wuqi496@163.com (Q.W.); xiaolizhu@shu.edu.cn (X.Z.);
Zhongqi0607@163.com (Q.Z.)

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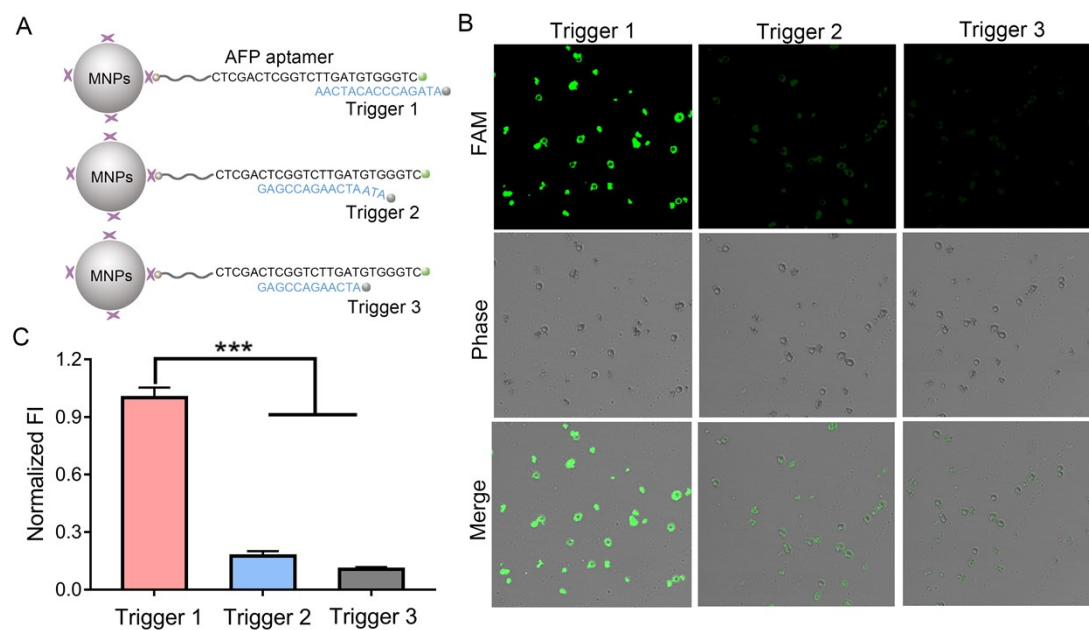


Fig. S1 Optimization of the sequences of triggers. (A) Schematic for combination of three groups of triggers. Trigger 2 and trigger 3 share the same complementary sequences for AFP aptamer, trigger 2 has an additional three-base tail to show the difference with trigger 3. (B) Confocal laser scanning imaging results of three triggers in the presence of AFP. (C) Normalized fluorescence intensity of three groups of triggers for the detection. * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$, by Student's t-test.

Error bars represent the mean $\pm$ SD, where $n = 3$. FI, fluorescence intensity.

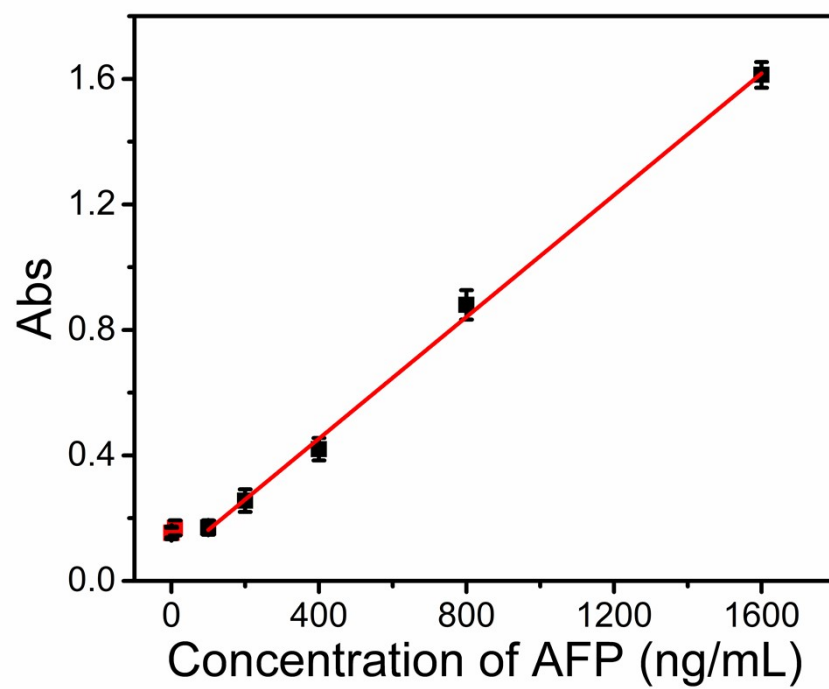


Fig. S2 Linear fitting of absorbance for detection of AFP in different concentrations by ELISA. The linear range for ELISA is 100-1600ng/ml.

Table S1. Sequences of DNA oligonucleotides used in this work.

oligonucleotide	Sequence (5'→3')	Modification
AFP aptamer	(T) ₆ GTGACGCTCCTAACGCTGACTCAGGTGCA GTTCTCGACTCGGTCTTGATGTGGGTC	5'-biotin
AFP aptamer-FAM	(T) ₆ GTGACGCTCCTAACGCTGACTCAGGTGCA GTTCTCGACTCGGTCTTGATGTGGGTC	5'-Biotin 3'-FAM
Trigger 1-BHQ	ATAGACCCACATCAA	5'-BHQ
Trigger 2-BHQ	ATAATCAAGACCGAG	5'-BHQ
Trigger 3-BHQ	ATCAAGACCGAG	5'-BHQ
Random probe-FAM	TCTATATGCGGTATGTGCTACATCATATATAA AAACTTTAAGAAAGGTTATGGCTGTA	5'-Biotin 3'-FAM
Random trigger-BHQ	ATATACAGCCATAAC	5'-BHQ
Trigger	AGTCTAGGATTCGGCGTGGGTAAATAGACCC ACATCAA	
H1	TTAACCCACGCCGAATCCTAGACTCAAAGTAG TCTAGGATTCGGCGTG	
H2	AGTCTAGGATTCGGCGTGGGTAAACACGCCG AATCCTAGACTACTTTG	
H2-H2	AGTCTAGGATTCGGCGTGGGTAAACACGCCG AATCCTAGACTACTTTGAGTCTAGGATTCGGC GTGGGTAAACACGCCGAATCCTAGACTACTTT G	
sgRNA	ATTCGGCGTGGGTAAACACGCCATCTACACTT AGTAGAAATTACCCTATAGTGAGTCGTATTAA TTTC	
ssDNA-FQ probe	ATATAA	5'-FAM 3'-BHQ