

Supporting Information

High-Sensitivity Fluorescence Detection for lung cancer CYFRA 21-1 DNA based on Accumulative Hybridization of Quantum Dots

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Table 1

Oligonucleotide sequences used in CYFRA21-1 detection.

Name	Sequence (5' to 3')
Target	CGCCCCTGACACCATTTCCTCCCTTC
Probe A	NH₂ -TTTTTTCAGCGGAAGGGAGGAATGGTGTTCAGGGGCG GAACGTACACGCTGA
Probe B	TCGTCATGATCACTTCGGTCAGCGTGTACGTTGACTGACG ATTTTT- SH
Probe C	CCGAAGTGATCATGACGAGTCAACGTACACGCTGACTTCG GTTTTT- SH

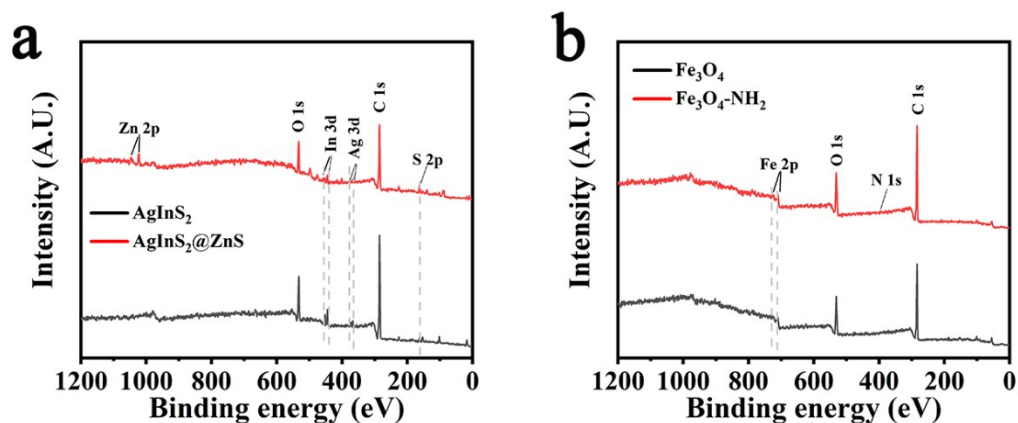


Figure S1. XPS spectra for survey scans of (a) AgInS₂ and AgInS₂@ZnS QDs, (b) Fe₃O₄ and Fe₃O₄-NH₂. In the left spectrum, in addition to the Ag, In, and S peaks, two new peaks attributed to Zn appear in the AgInS₂@ZnS spectrum compared to the spectrum of AgInS₂. Similarly, in the right spectrum, the peak at 392 eV is observed in the spectrum of Fe₃O₄-NH₂ because the surface of Fe₃O₄ is modified with amino groups.

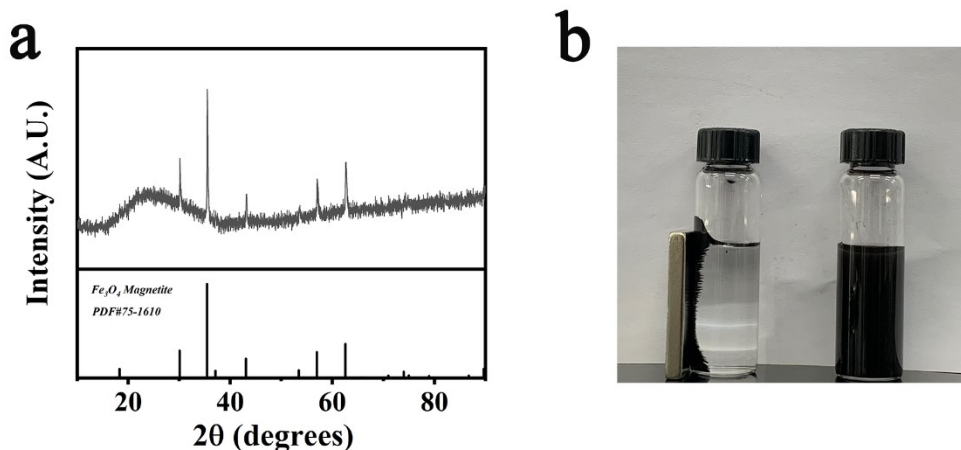


Figure S2. (a) X-ray diffractogram of Fe₃O₄. It shows that there are five main peaks centered at 30.1, 35.5, 43.1, 57.1 and 62.6° that match with the magnetite Fe₃O₄ standard card. (b) The magnetic adsorption diagram of Fe₃O₄.

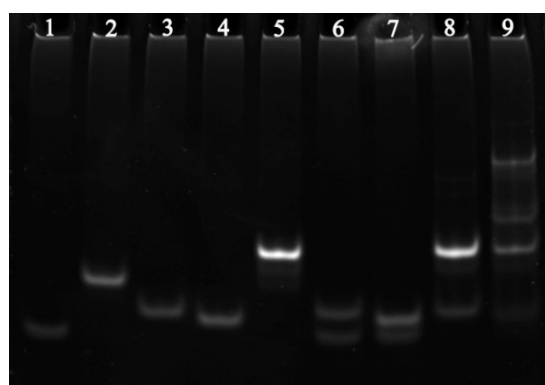


Figure S3. Images of polyacrylamide gel electrophoresis migration. The bands 1, 2, 3, 4 represent target DNA, hairpin A, hairpin B and hairpin C, respectively. The band 5 means that target DNA and hairpin A are mixed together, it can be seen that the band appears at a higher position compared to band 1 and 2, which shows that target DNA can open hairpin A. The band 6 and 7 means that target DNA mixes with hairpin B and C, respectively, which shows that target DNA can not open hairpin B and C directly. The band 8 means that target DNA mixes with hairpin A and B. The band 9 means that target DNA mixes with hairpin A, B and C together, the band in the uppermost position

shows that they can carry out chain polymerization in an orderly manner.

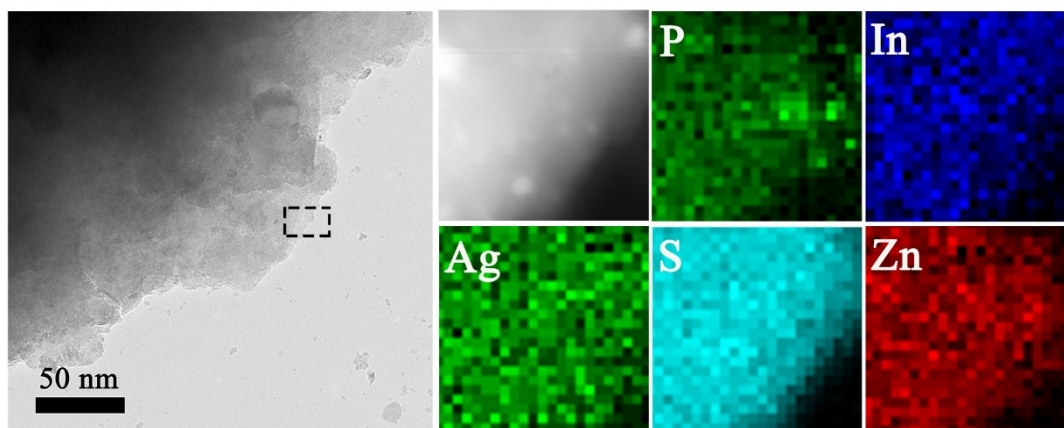


Figure S4. Elemental mapping images of Fe_3O_4 surface connected QDs

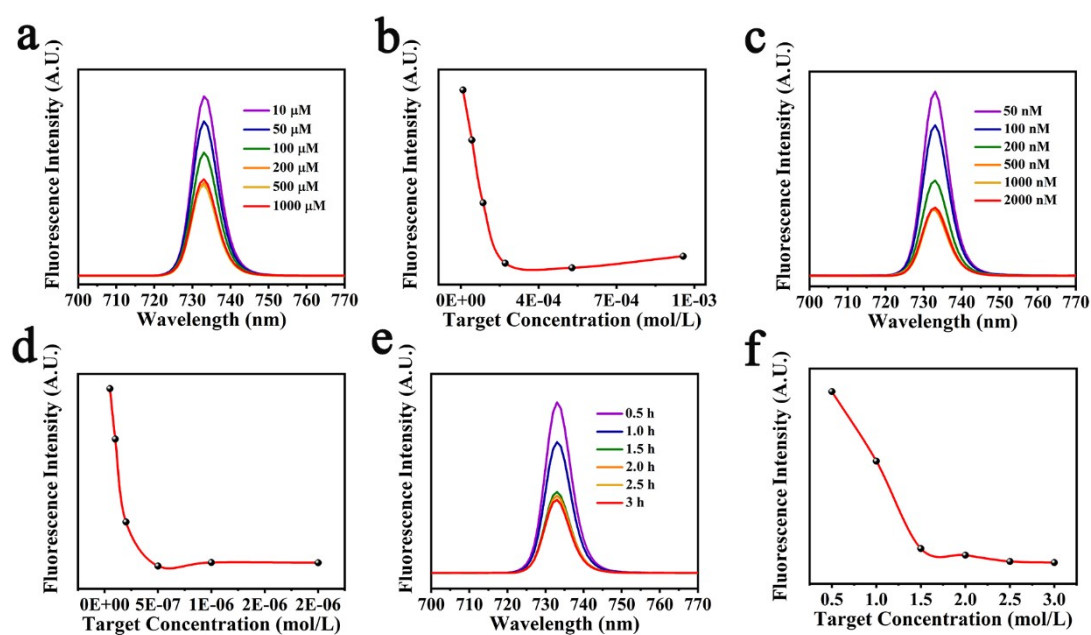


Figure S5. (a) and (b) The optimal concentration of AIZS modified with hairpin B/C. (c) and (d) The optimal concentration of Fe_3O_4 modified with hairpin A. (e) and (f) The optimal reaction time of hybridization chain reaction.