

Functional nucleic acid-based fluorescence sensing platform based on DNA supersandwich nanowires and cation exchange reaction

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Supplementary figures

Materials

Bovine serum protein (BSA), 1-ethyl (3-dimethylaminopropyl) carbodiimide hydrochloride (EDC), N-hydroxysuccinimide (NHS), zinc acetate $(\text{CH}_3\text{COO})_2\text{Zn}$, thiourea ($\text{CH}_4\text{N}_2\text{S}$), 4-(N-maleimidemethyl) cyclohexane-1-carboxylic acid sulfonic acid succinimidyl ester sodium salt (Sulfo-SMCC), treptavidin (SA), β -mercaptoethanol (MCH) were purchased from Sigma Inc. (USA). Silver nitrate (AgNO_3) and polyvinylpyrrolidone (PVP) were purchased from McLean Reagent Co., Ltd. (Shanghai, China). Sterilized water ($18.2 \text{ M}\Omega \cdot \text{cm}^{-1}$) was used in the experiment. All DNA strands used in the system were purchased from Shenggong BioEngineering Shanghai Co., Ltd. (Shanghai, China), and its sequence is shown in Table S1.

Apparatus

X-ray powder diffraction (XRD) patterns were acquired by an X-Ray diffractometer D8 ADVANCE (BRUKER, Germany). The morphology of ZnS NCs was obtained by transmission electron microscope (TEM, FEI Tolas F200x, America). Atomic force microscopy (AFM) image was acquired by an atomic force microscopy (BRUKER, Germany). All of the data was measured by a fluorescence spectrophotometer (F-7100) in the wavelength range of 505 nm-600 nm, set the excitation and emission slit width of 5 nm, under the operating voltage and excitation wavelength of 750V and 494 nm.

Table S1 The DNA sequences used in experiment

sequence	from 5' to 3'
cp DNA	CGCACCTCAATTTTT-SH
bridge DNA	TAGACTGTCTTAGCTCTTCGAAACATGCATGGCACAAACATTTTTG CGGACACGCGGACACGCGGACAC
s-DNA	GTGTCCGCTTTTTTTTT-biotin
auxiliary DNA	AGCTAAGACAGTCTAATGCATGTTTCGAAG
p53 DNA	TTGAGGTGCGTGTGTTGTGCC
catalytic molecular beacons	FAM- CCACCACAATGTTATACAGGTACTAT/rA/GGAAGTTGAGTTACGAG GCGGTGGTGG-BHQ1
DNAzyme	CTCAACTTCTCCGAGCCGGTCGAAATAGTACCT
P1	TTGAGGTGCG<u>A</u>GTTTGTGCC
P2	<u>G</u>TGAGGTGCGTGTGTTGTGCC
P3	TTGAGGTGCGTGTGTTGTGC<u>G</u>
P4	TTGAGGTGCT<u>A</u>GTTTGTGCC
P5	<u>G</u>CGAGGTGCGTGTGTTGTGCC
P6	TTGAGGTGCT<u>A</u>ATTGTTGTGCC

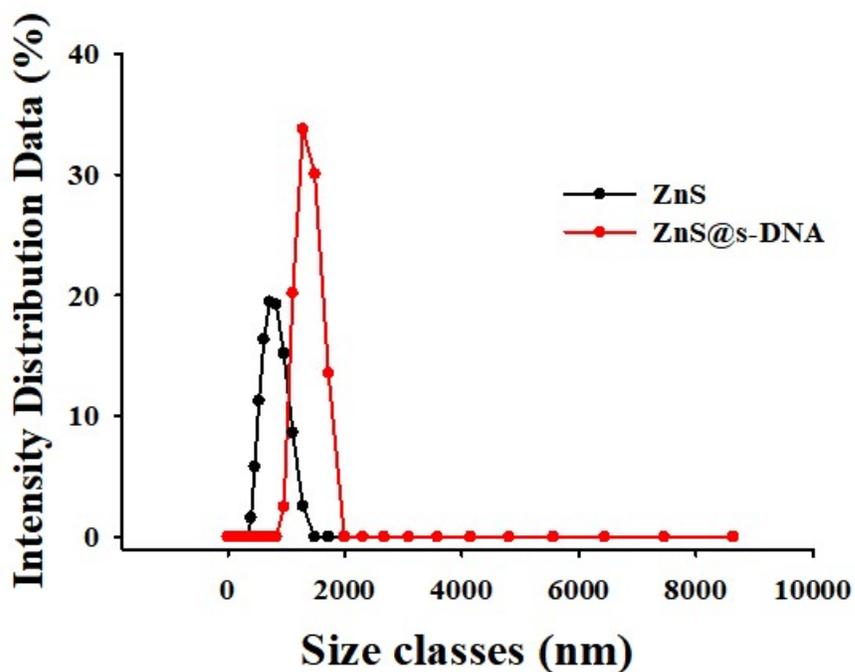


Fig.S1 Particle size of ZnS and ZnS@s-DNA