Supporting Information

Colorimetric Aptasensor Based on Fluorescein as Temporal Controllable Light-Stimulated Oxidase Mimicking for Sensitive Detection of Exosomes in Mild Condition

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Table S1. The sequence of DNA used in this work

Name	Sequence (from 5' to 3')
FITC labeled DNA anchor	Cholesterol-TTTTTTTTTTTTTTTTTTTTTTTTTTTTTT-FITC
EpCAM aptamer	Biotin-GCACTACAGAGGTTGCGTCTGTCCCACGTTGTCATGGGGGGTTGGCCTG
Random sequence	Biotin-TTCGTGCAGTCCATTGATGGGTGCAGTTAAATTCCTGCATGAATTAATT

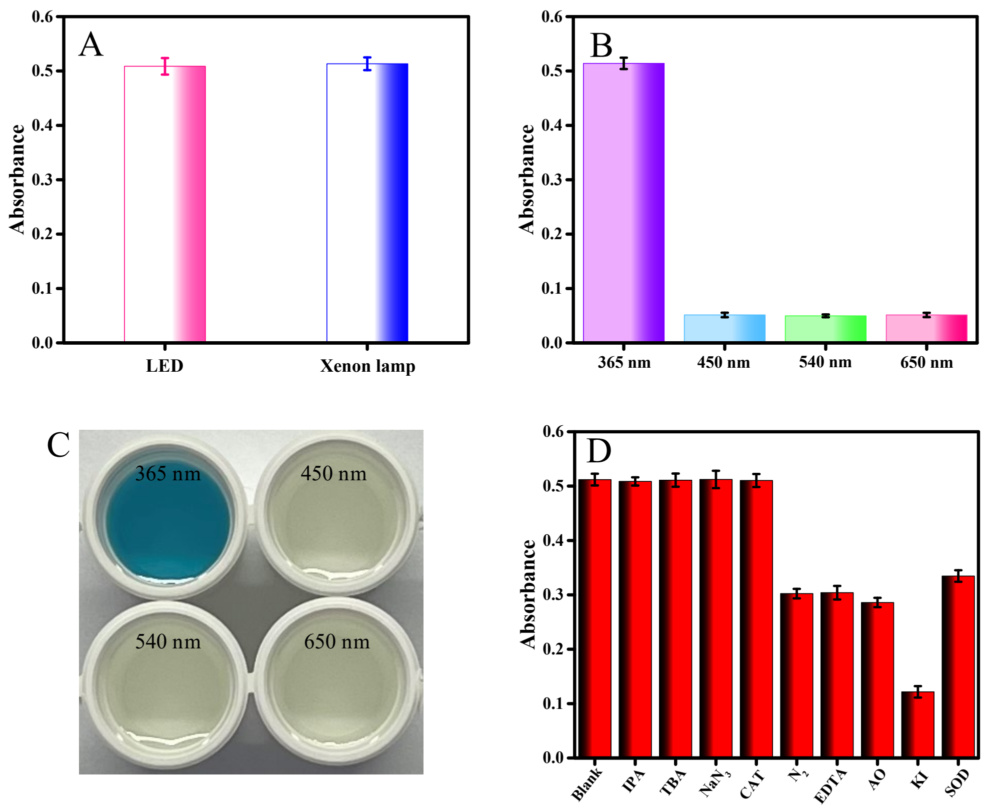

Figure. S1. (A) The TMB oxidation by FITC under LED and xenon lights. (B) The TMB oxidation by FITC under LED lights with different wavelengths. (C) The photographs of TMB oxidation by FITC under LED lights with different wavelengths. (D) Effects of scavengers on the TMB-FITC chromogenic reaction under 365 LED light irradiation.

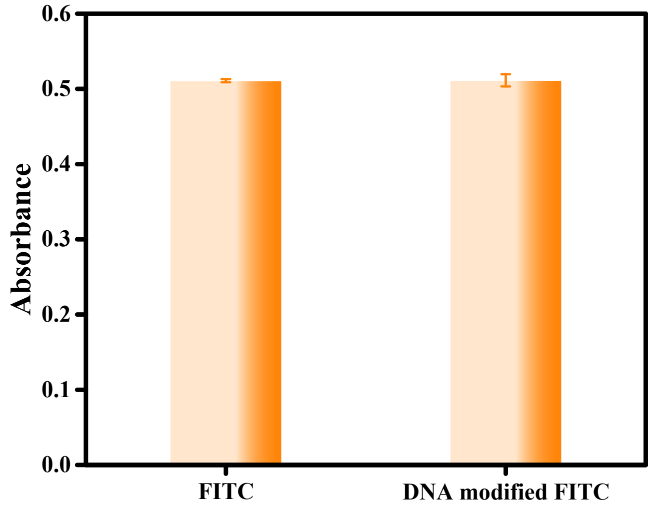

Figure S2. The TMB oxidation by free FITC and DNA modified FITC under LED light.

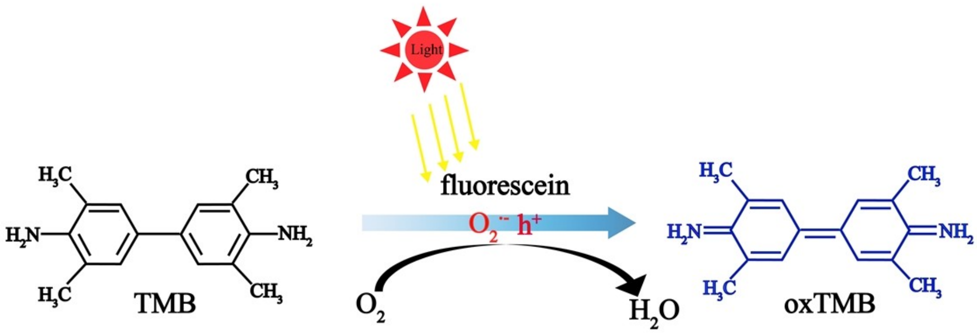

Figure S3. Proposed mechanism for light-stimulated oxidase mimicking activity of FITC.

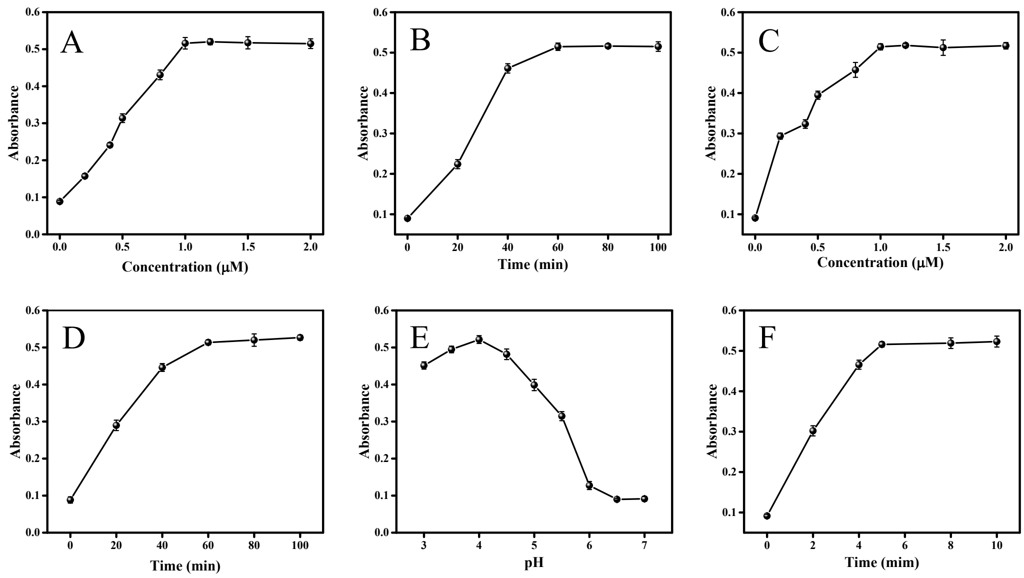

Figure S4. The optimization of experimental conditions. Influence of (A) aptamer concentration, (B) the capturing time for exosomes, (C) DNA anchor concentration, (D) incubation time between DNA anchor and exosomes, (E) the pH value for colorimetric reaction, (F) the light irradiation time.

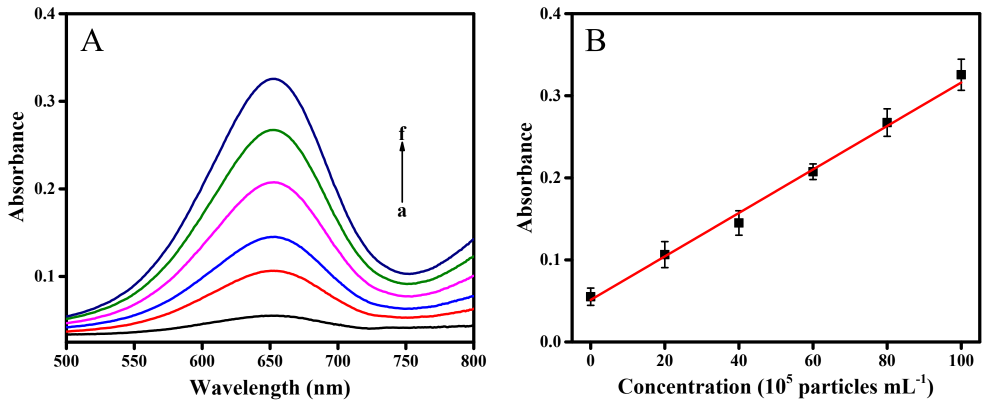

Figure S5. (A) UV-vis absorbance toward different exosomes concentrations (from a to f represented 0, 20.0, 40.0, 60.0, 80.0, 100.0×10^5 particles mL^{-1}). (B) Linear calibration curve of detection exosomes.

Table S2. Comparison of the present aptasensor and other methods for exosomes detection

Methods	LOD (particles/mL)	Detection range (particles/mL)	Ref.
An integrated magneto-fluorescent nanosensor	1.71×10^{6}	2.86×10^{6}-2.86×10^{10}	44
Electrochemical aptasensor based on DNA functionalized covalent organic frameworks	9.66×10^{6}	10^{7}-10^{10}	45
A fluorescent method based on steric hindrance-controlled signal amplification	4.8×10^{5}	1.66×10^{6}-1.66×10^{9}	46
Electrochemical method based on DNA/ferrocene-modified single-walled carbon nanotube	9.38×10^{4}	4.66×10^{6}-9.32×10^{9}	47
DNA-functionalized covalent organic framework capsules	8.7×10^{4}	2.5×10^{5}-2.5×10^{10}	48
A sensor based on in-suit synthesis fluorescent polymers	1.161×10^{4}	5.00×10^{4}-5.00×10^{8}	49
Colorimetric aptasensor based on spherical nucleic acid-induced hybridization chain reaction	5.0×10^{4}	0-10^{6}	50
A colorimetric aptasensor based on terminal deoxynucleotidyl transferase	4.5×10^{4}	1.0×10^{5}-1.0×10^{6}	51
Colorimetric and photothermal dual-mode biosensor	1.027×10^{6} 2.170×10^{6}	2.0×10^{6}-4.0×10^{7}	52
A colorimetric aptasensor based on	5.2×10^{8}	1.84×10^{9}-2.21×10^{10}	53

DNA-capped single-walled carbon nanotubes			
Dual-modal aptasensor based on acridone derivative	1.3×10^5	5.0×10^6-1.0×10^9	54
A colorimetric aptasensor based on light-stimulated oxidase mimicking of FITC	1.77×10^5	0-100×10^5	This work

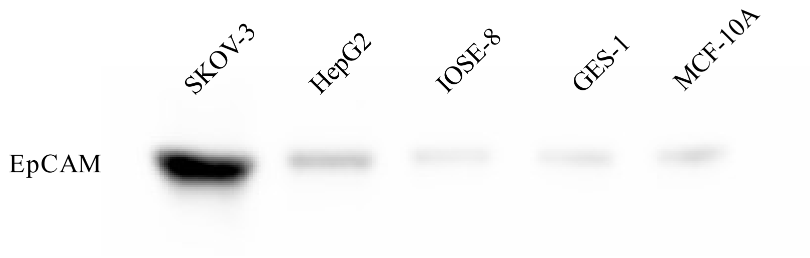

Figure S6. The WB images of EpCAM from different cell lines derived exosomes, including SKOV-3, HepG2, IOSE-8, GES-1, and MCF-10A.

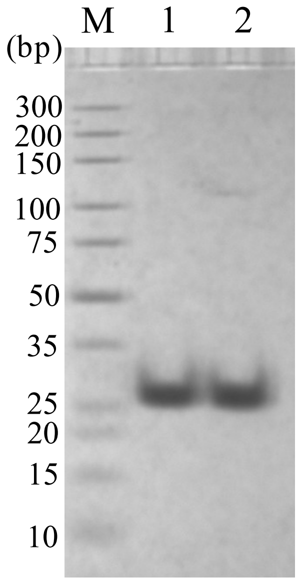

Figure S7. PAGE results of the EpCAM aptamer. Lane M: marker, lane 1: EpCAM aptamer in PBS, lane 2: EpCAM aptamer in serum.

Table S3. Performance of exosomes and serum CA-125 in OC *versus* HD discrimination (Ninety-five percent CIs are indicated in parentheses)

Marker	Sensitivity (%)	Specificity (%)	Accuracy (%)	AUC
Exosomes	93.8 (85.4 - 100)	100 (100)	96.3 (96.2 - 96.4)	0.994 (0.983 - 1.000)
Serum CA-125	43.8 (26.6 - 60.9)	90.9 (78.9 - 100)	63.0 (62.1 - 63.8)	0.645 (0.496 - 0.793)