Electronic Supplementary Material (ESI) for Nanoscale.

Supporting Information

Combined Fenton and Starvation Therapy using Hemoglobin and Glucose oxidase

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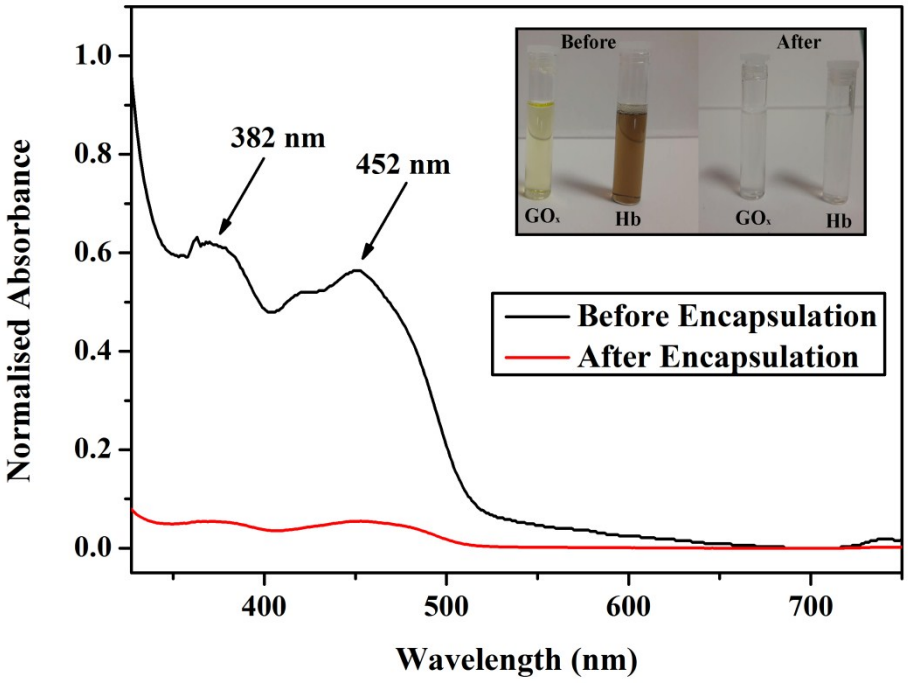

Figure S1: Normalized UV−vis absorbance of synthesised solution before and after encapsulation. The inset shows the digital images of synthesised solution before and after encapsulation.

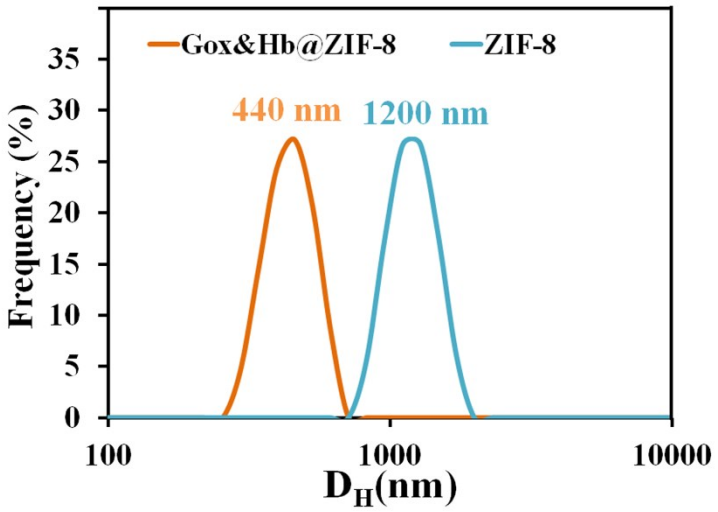

Figure S2: The DLS data of ZIF-8 and GO_x&Hb@ZIF-8 nanoparticles.

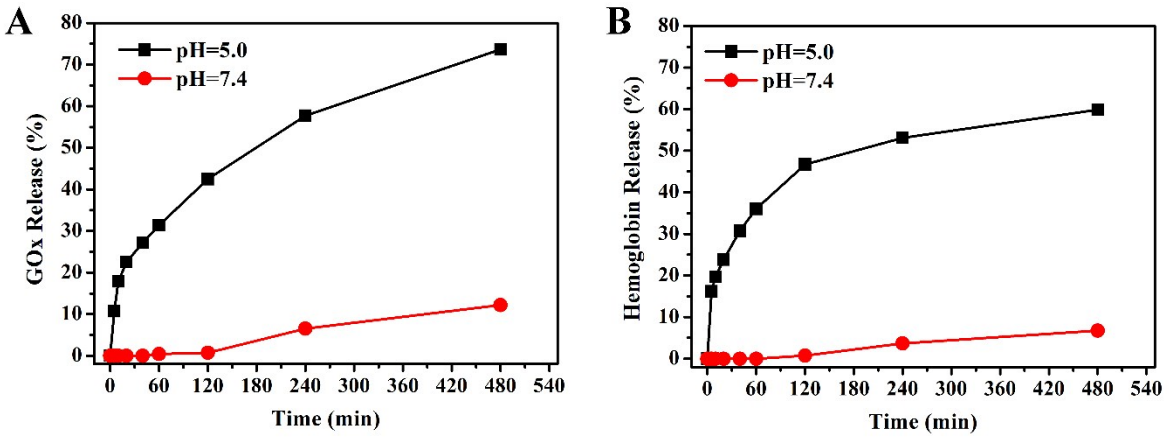

Figure S3: (A) GOx and (B) Hb release from GOx @ZIF-8 and Hb@ZIF-8 in buffer at different pH (5 and 7.4)

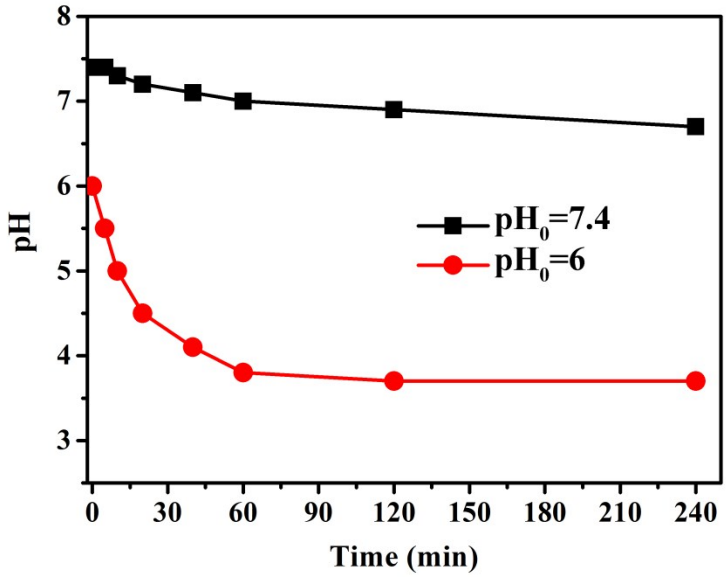

Figure S4: Changes of pH values in the presence of GOx&Hb@ZIF-8 (50 μg/mL) and D-glucose (50 mM) at different initial pH (6.0 and 7.4).

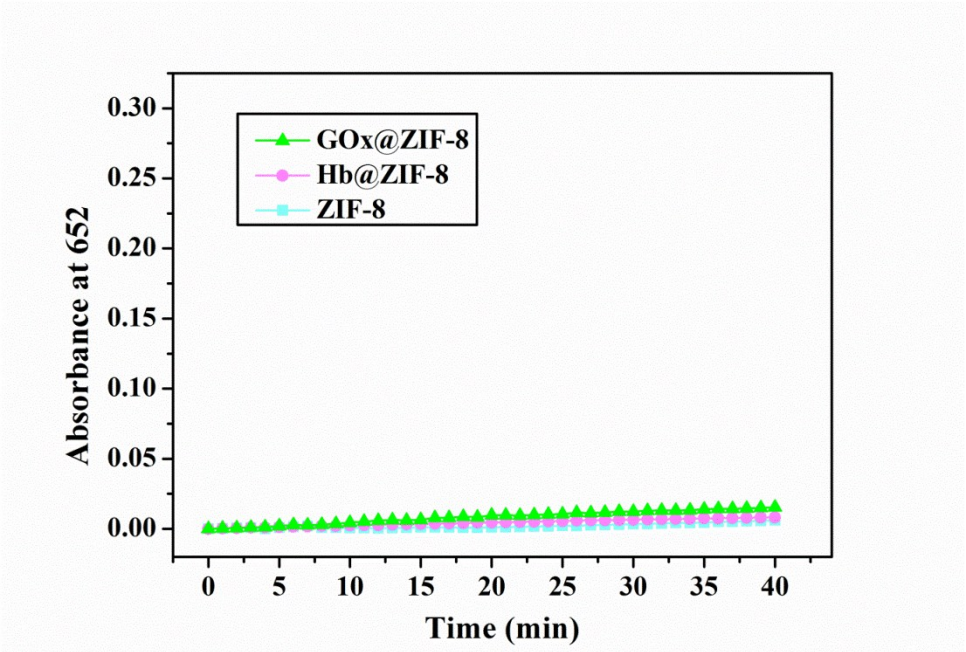

Figure S5: Absorbance at 652 nm changes with time at pH 5, 25 °C, 50 μg/mL nanoparticles, 10 mM D-glucose and 1 mM TMB for different type of nanoparticles

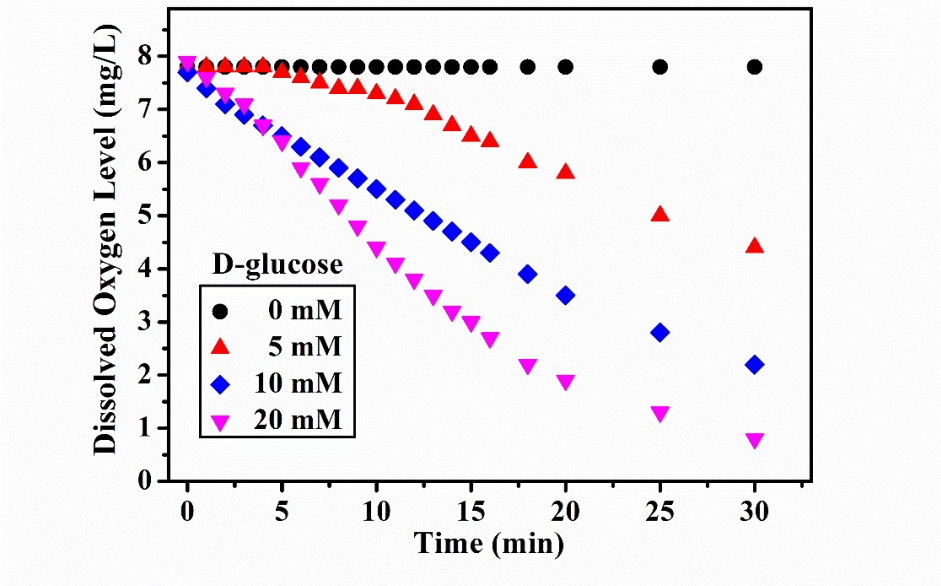

Figure S6. Dissolved oxygen concentrations versus time at pH 5.0, 25 °C, 1 mg/mL GOx&Hb@ZIF-8 in different concentration of D-glucose.

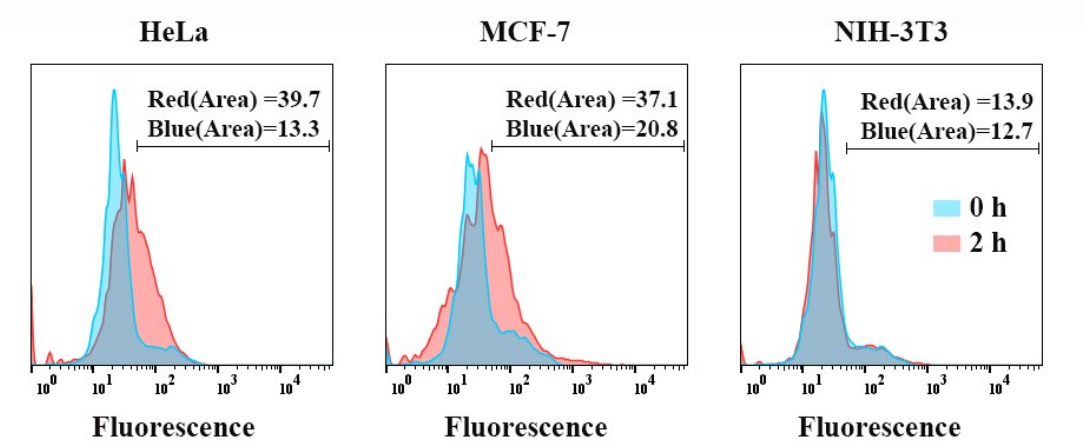

Figure S7: Flow cytometry analysis of oxygen levels in HeLa, MCF-7 and NIH-3T3 cells treated with 5 μg/mL GOx&Hb@ZIF-8 after 2 h, detected by a $[Ru(dpp)_3]^{2+}$ probe.

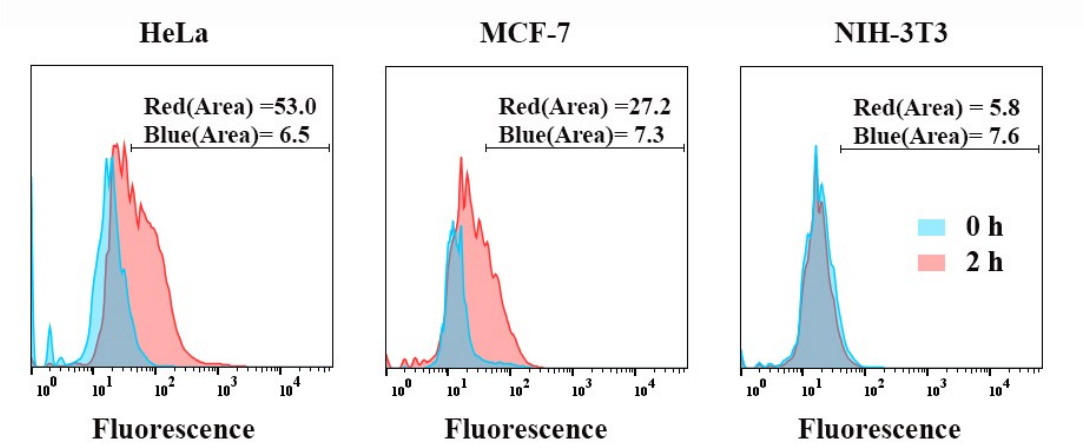

Figure S8: Flow cytometry analysis of ROS level in HeLa, MCF-7 and NIH-3T3 cells treated with 5 μg/mL GOx&Hb@ZIF-8 after 2 h detected by DCF-DA probe

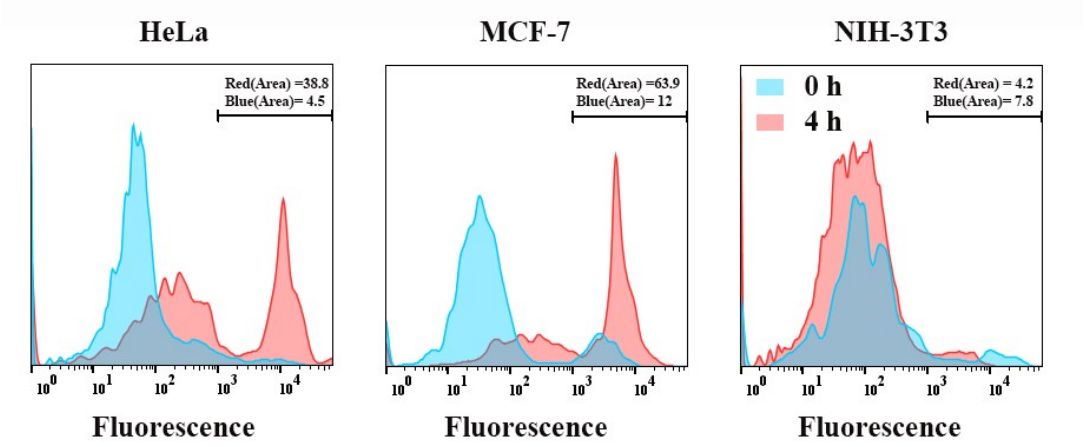

Figure S9: Cytotoxicity of 5 μg/mL GOx&Hb@ZIF-8 toward NIH-3T3, HeLa and MCF-7 cells incubated for 4h using propidium iodide (PI) staining and flow cytometry.

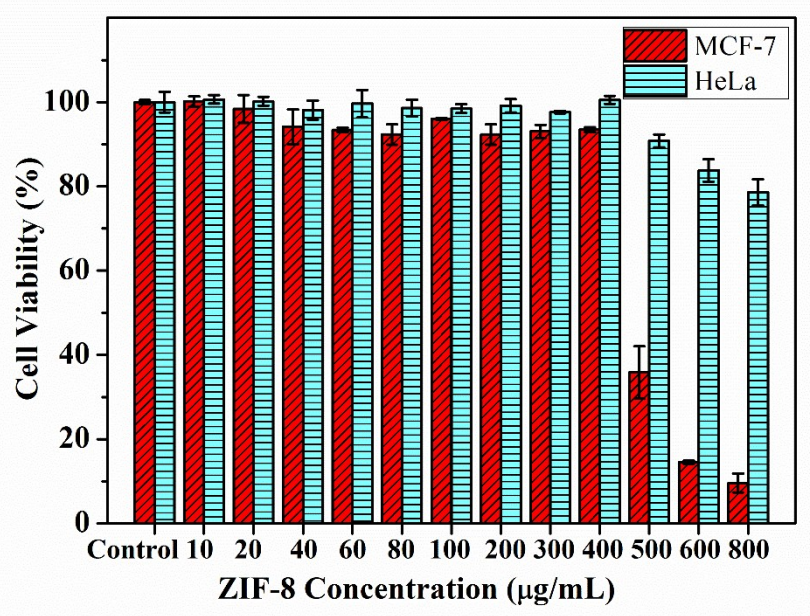

Figure S10: Cytotoxicity of ZIF-8 toward HeLa and MCF-7 cells incubated for 24.

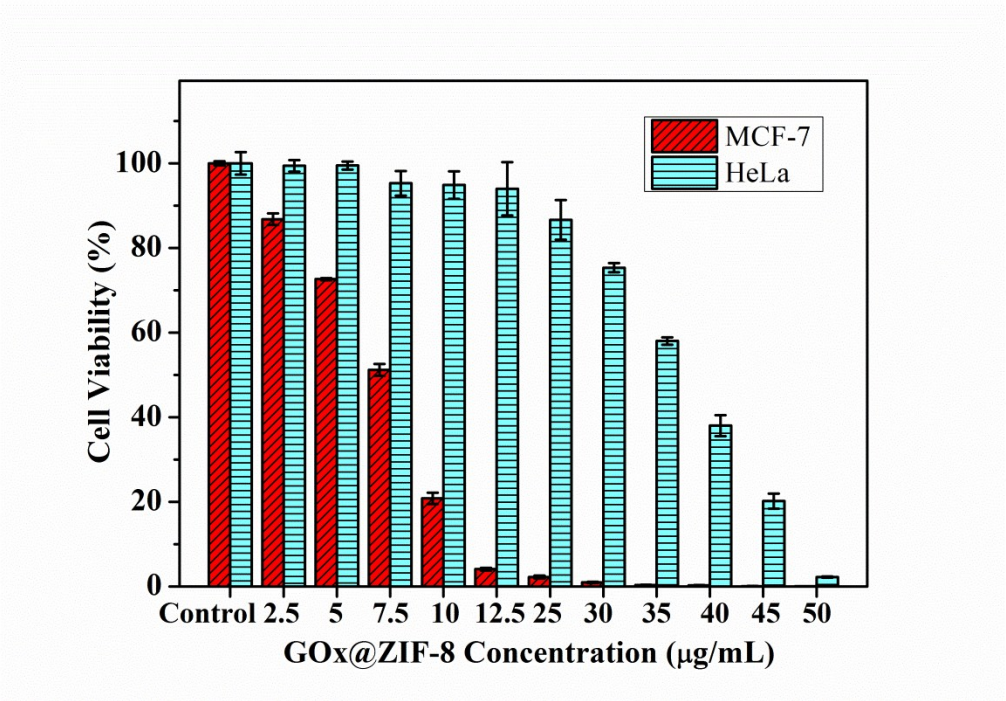

Figure S11: Cytotoxicity of GOx @ZIF-8 toward HeLa and MCF-7 cells incubated for 24 h.

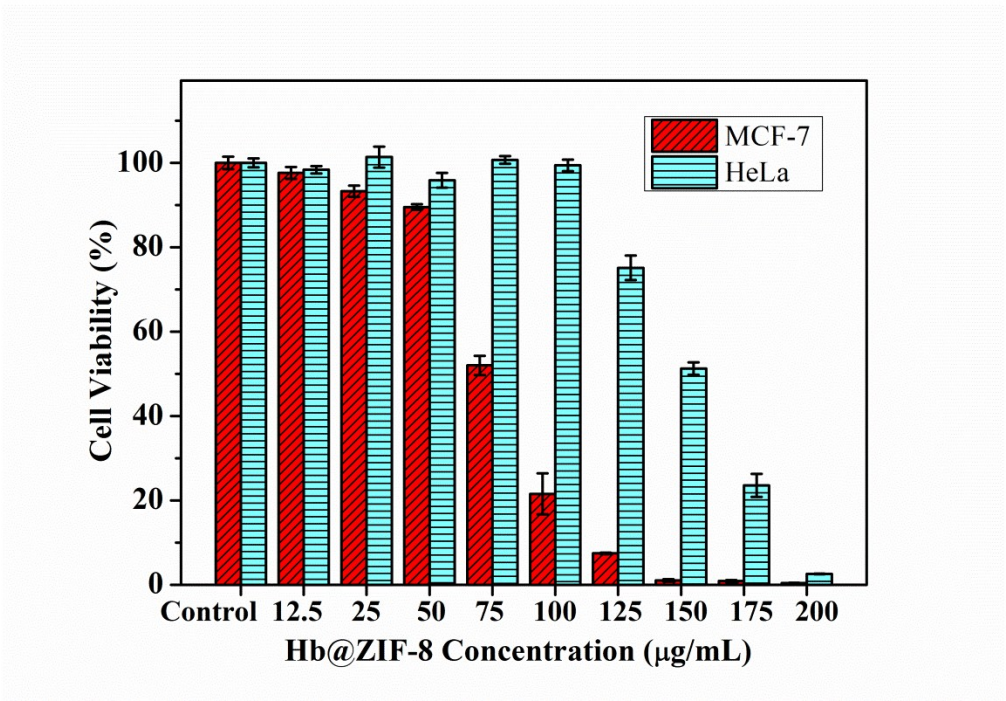

Figure S12: Cytotoxicity of Hb@ZIF-8 toward HeLa and MCF-7 cells incubated for 24.

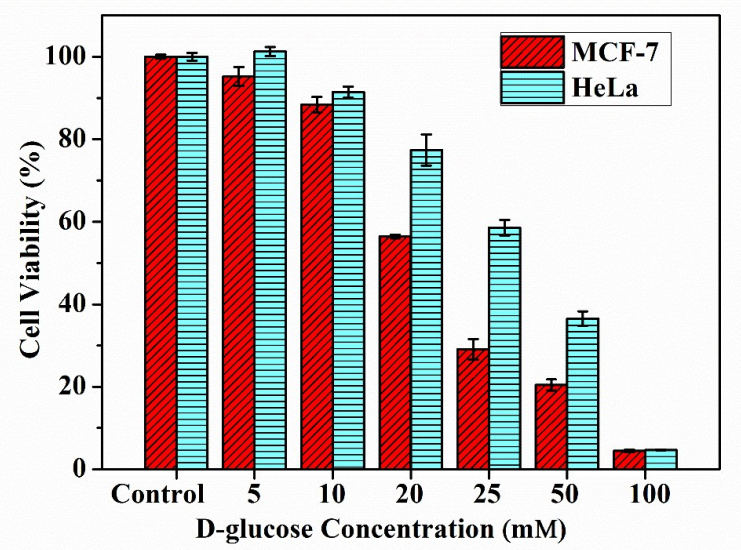

Figure S13: Cytotoxicity of GOx&Hb@ZIF-8 in different concentrations of D-glucose toward HeLa and MCF-7 cells incubated for 24.

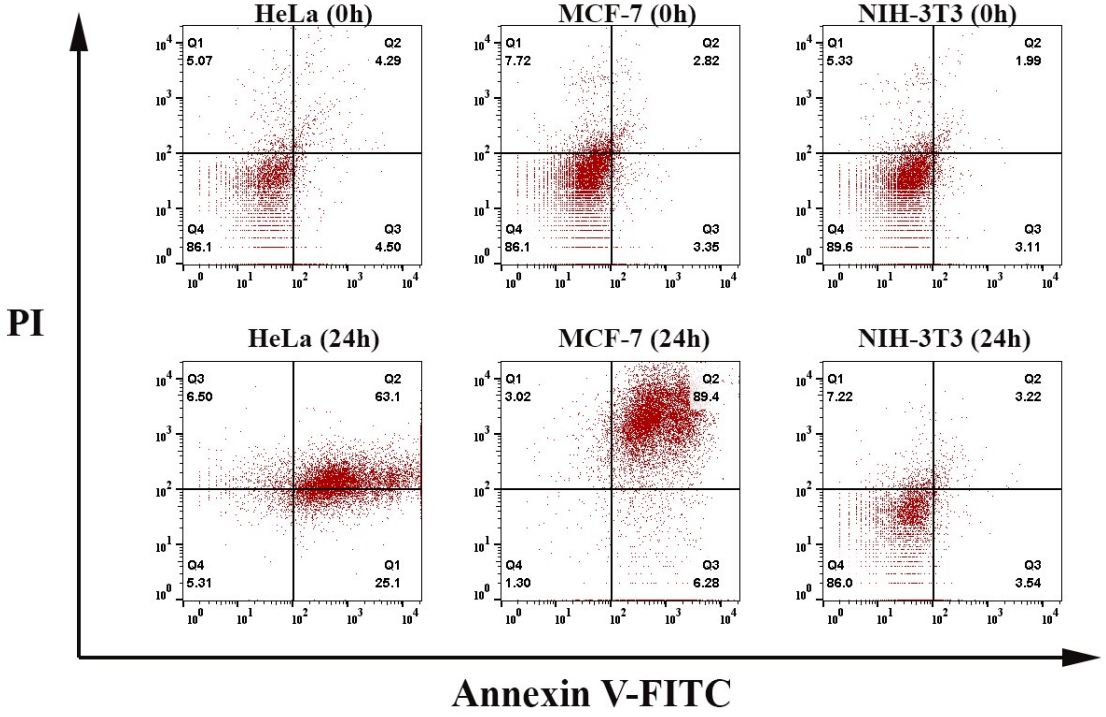

Figure S14: Flow cytometric apoptosis and necrosis analysis of NIH-3T3, HeLa and MCF-7 cells stained by Annexin V-FITC and propidium iodide (PI) after 24 h incubation with 4 μg/mL GOx&Hb@ZIF-8.

Table S1: Calculated combination index of GOx&Hb@ZIF-8 at different selectivity index

	CI25	CI50	CI75	CI100
HeLa	0.064	0.101	0.137	0.198
MCF-7	0.194	0.224	0.277	0.266

Scheme S1: Schematic illustration of Fe ion release from hemoglobin in the presence of H_2O_2