Electronic supplementary information (ESI)

Siramesine-loaded Metal Organic Framework Nanoplatform for Overcoming Multidrug Resistance with Efficient Cancer Cell Targeting

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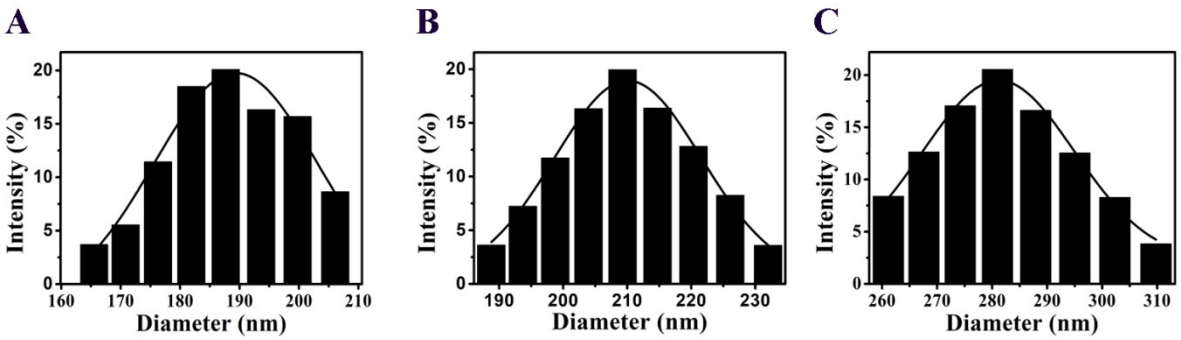

Figure S1. DLS analysis of ZIF-8, ZIF-8@Sira and ZIF-8@Sira/FA.

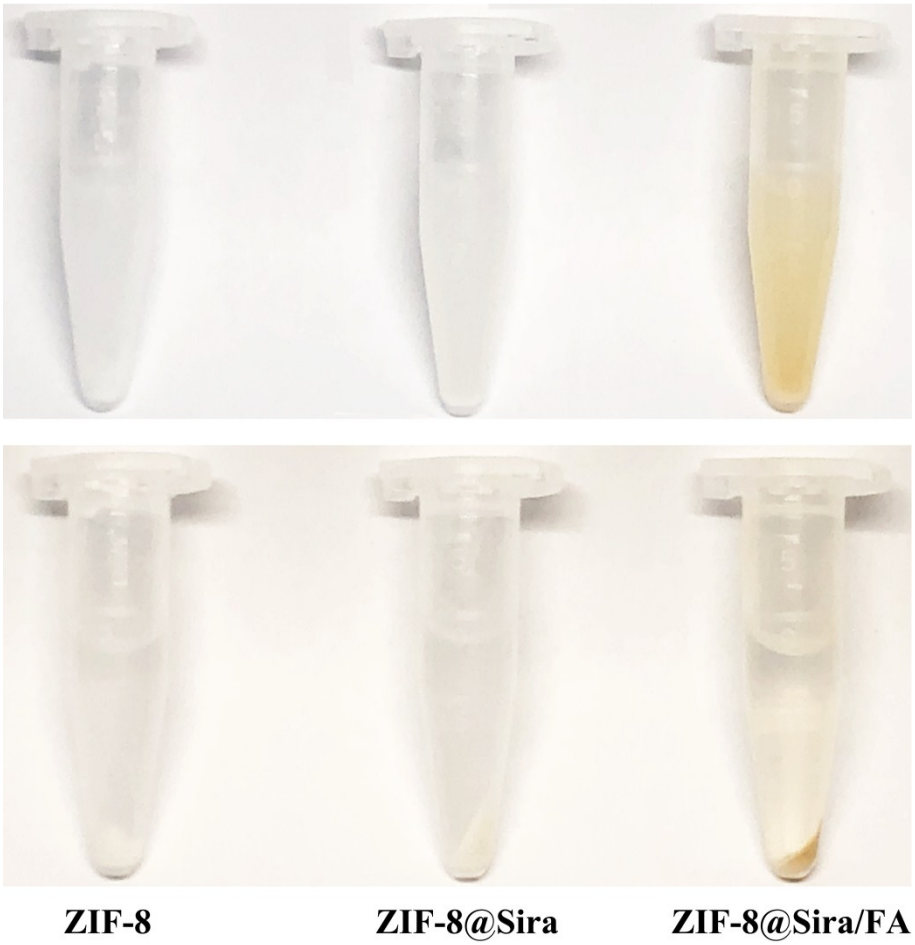

Figure S2. Photographic images of ZIF-8, ZIF-8@Sira and ZIF-8@Sira/FA aqueous solution before (top) and after (bottom) centrifugation.

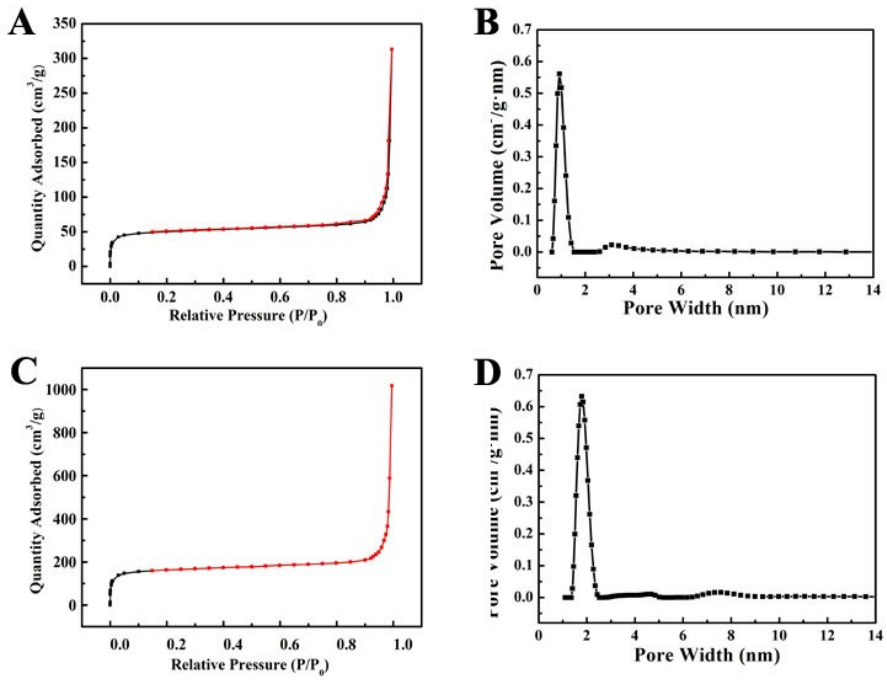

Figure S3. Nirogen adsorption-desorption isotherms of ZIF-8 (A) and ZIF-8@Sira (C) and the pore size distribution of ZIF-8 (B) and ZIF-8@Sira (D).

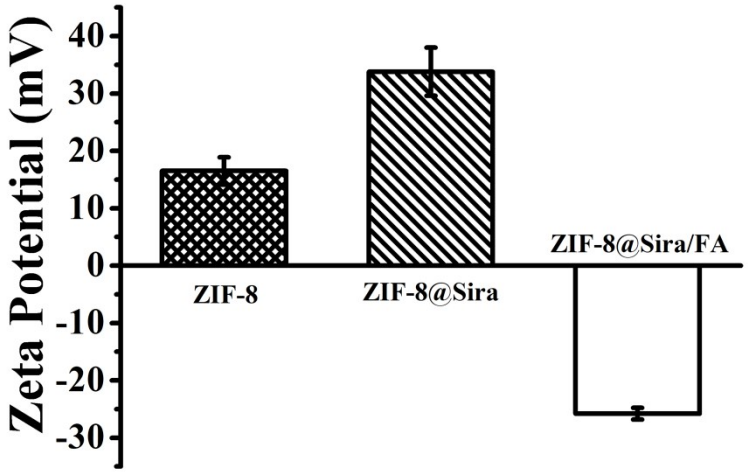

Figure S4. Zeta potentials of ZIF-8, ZIF-8@Sira and ZIF-8@Sira/FA, bars represent mean ± standard deviation (n = 3).

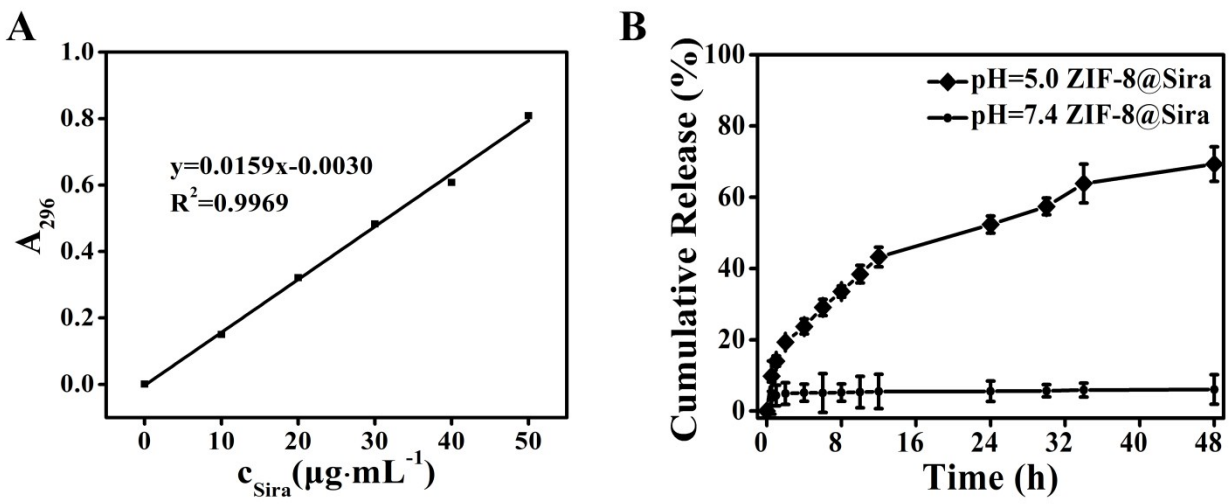

Figure S5. Drug release assay in vitro. (A) Linear calibration plots for siramesine detection; (B) The release curves of siramesine from ZIF-8@Sira in different PBS of pH 7.4 and pH 5.0 at 37 ℃.

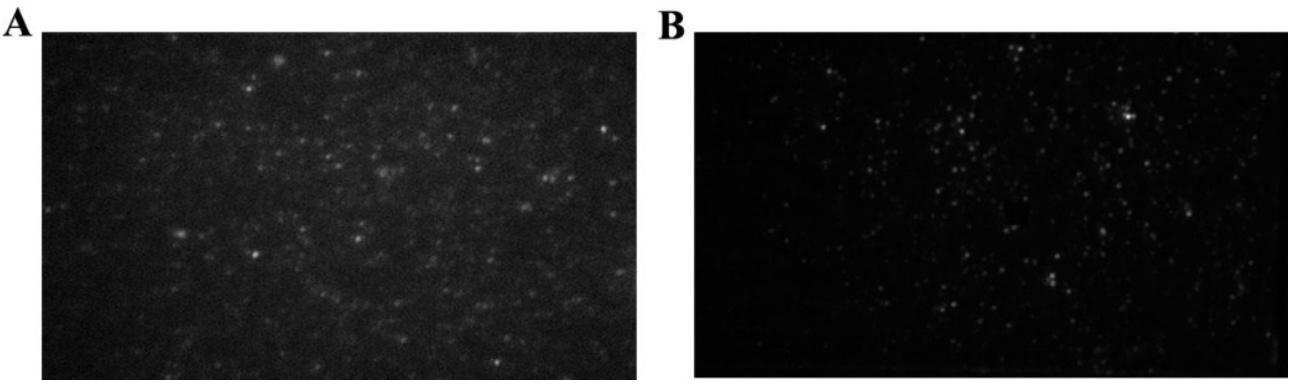

Figure S6. Single molecule fluorescence imaging of PFG-F (A) and ZIF-8/F (B).

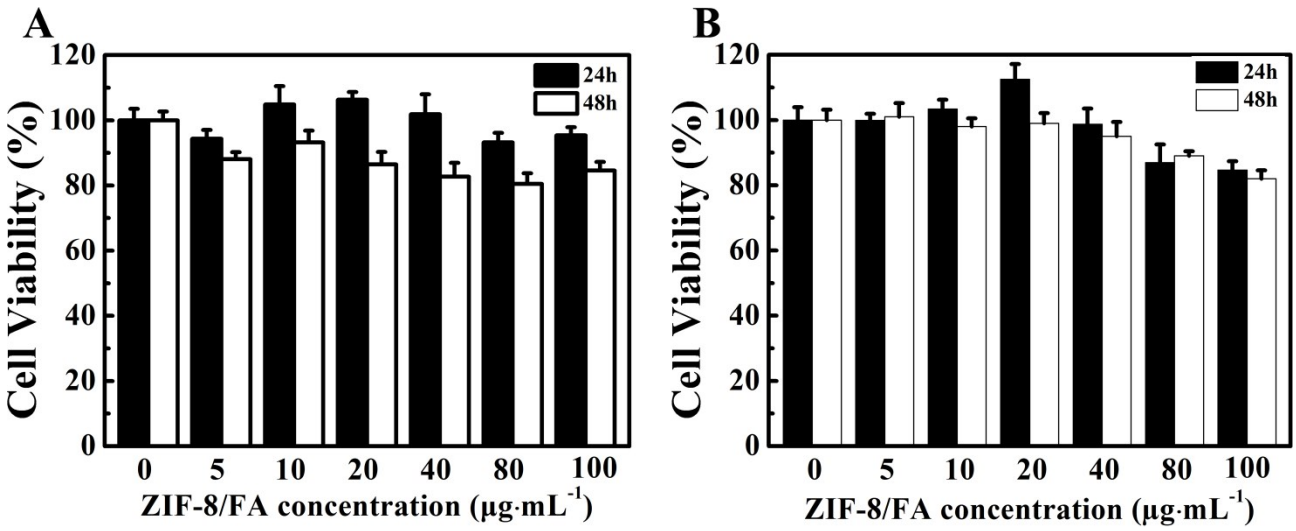

Figure S7. Cell viability of MCF-7 cells (A) and MCF-7/ADR cells (B) after incubating with ZIF-8/FA at different concentrations for 24 h and 48 h, the data are represent as the mean ± SD (n = 6).

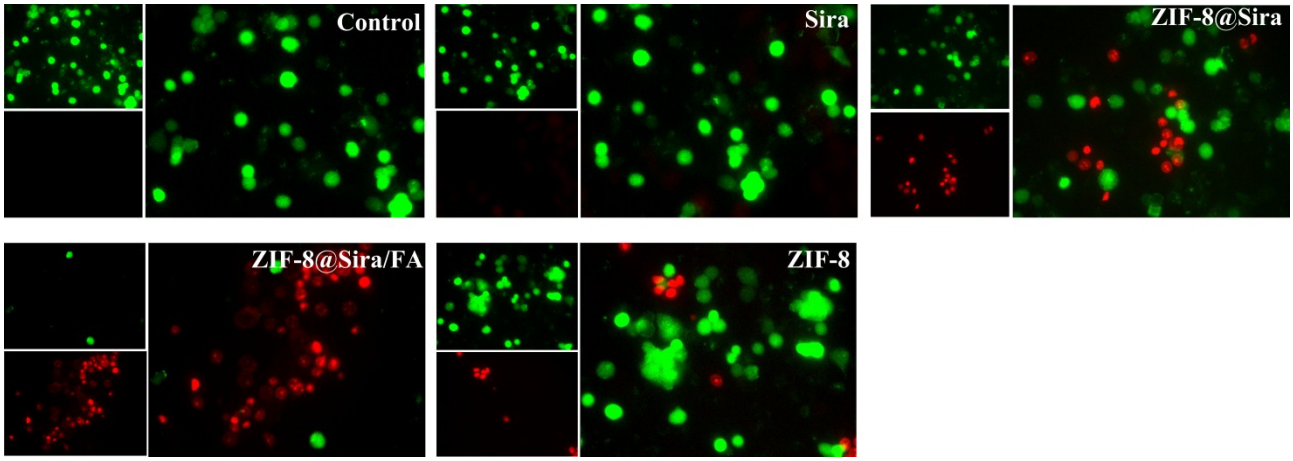

Figure S8. Confocal fluorescence images of drug delivery system incubated MCF-7 cells for 2 h. Live/dead stain shows dead cells as red and viable cells as green.

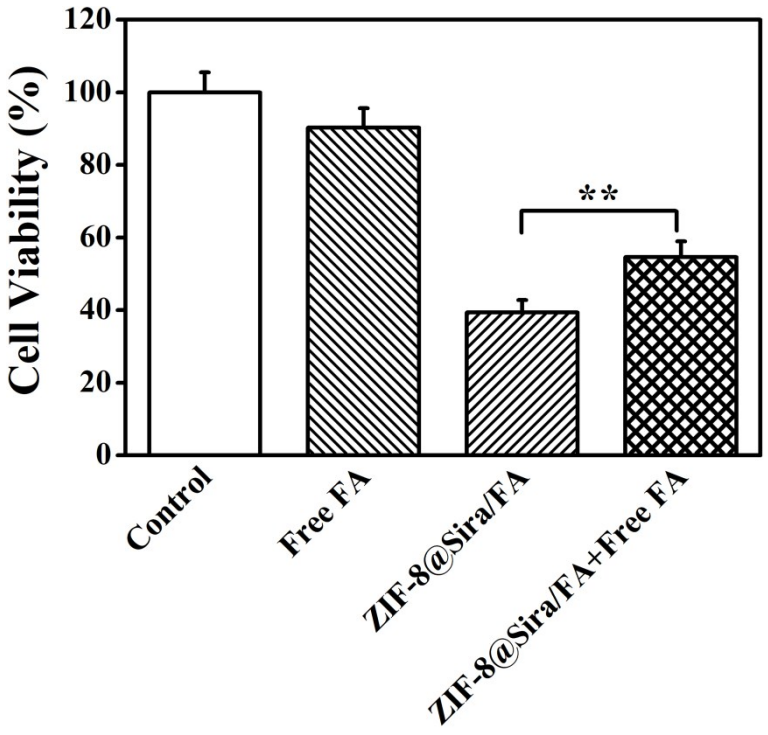

Figure S9. Cytotoxicity of ZIF-8@Sira/FA (2 μg·mL^{-1}) against MCF-7/ADR cells with free FA (5 μg·mL^{-1}) in 24 h. **p < 0.01 when compared with ZIF-8@Sira/FA group. Data are represented as mean ± SD (n = 3).

Table S1. The data obtained from TEM and DLS of NPs.

	Diameter (nm)	DLS size (nm)	PDI
ZIF-8	157 ± 6.8 (n = 100)	188 ± 6.1 (n = 3)	0.37
ZIF-8@Sira	168 ± 7.4 (n = 100)	209 ± 5.8 (n = 3)	0.42
ZIF-8@Sira/FA	193 ± 6.3 (n = 100)	281 ± 5.5 (n = 3)	0.26

Table S2. Analysis data of single molecule fluorescence imaging by Image-J.

	Fluorescence intensity	Particle number	MFI
PEG-F	207.16	2360	0.09
ZIF-8@Sira/F	215.84	862	0.25

Table S3. IC_{50} values for MCF-7 cells, MCF-7/ADR cells, and MCF-7/10A cells treated with ZIF-8 nanoparticles for 24 h and 48 h (n=3).

IC_{50} (μg·mL^{-1}) — 24 h	**MCF-7**	**MCF-7/ADR**	**MCF-10A**
Sira	2.72	8.64	7.46
ZIF-8@Sira	2.10	2.95	1.92
ZIF-8@Sira/FA	1.56	2.27	2.60

IC_{50} (μg·mL^{-1}) — 48 h	**MCF-7**	**MCF-7/ADR**	**MCF-10A**
Sira	3.32	8.57	5.97
ZIF-8@Sira	1.09	2.70	1.24
ZIF-8@Sira/FA	0.54	1.46	2.28