

Supporting Information

CRISPR/Cas9-based Coronal Nanostructures for Targeted Mitochondria Single Molecule Imaging

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Table of Contents

Table S1 DNA and RNA sequences used in this study.....	3
Figure S1 FT-IR spectra of PDNCs	4
Figure S2 Cellular uptake of PDNCs	4
Figure S3 Schematic of the multi-input design of AND logic gates.....	5
Figure S4 The cleavage kinetics.....	5
Figure S5 MTT assay	6
Figure S6 The significance of Cas protein	6
Figure S7 Discrimination of different cells.....	7
Figure S8 Effect of Transfer Efficiency on Fluorescence Intensity.....	7

Table S1 DNA and RNA sequences used in this study.

Primer	Sequence (5' - 3')
H1	HOOC-CCC CCT CAA CAT CAG TCT GAT AAG CTA
H2	GAC CGG G/iBHQ1dT/TC ATC TAA TGG AT/iTAMdT/C CCG GTC TAG CTT ATC AGA C
S1	HOOC- CCC CCA CAC AAA TTC GGT TCT ACA GGG
S2	CGG GAT CCA TTA GAT GAC CCG GTC AGT TAT CAG CAC CCT GTA GAA CGG
miRNA-21	UAG CUU AUC AGA CUG AUG UUG A
miRNA-10b	CCC UGU AGA ACC GAA UUU GUG U
miRNA-21 DNA	TAG CTT ATC AGA CTG ATG TTG A
miRNA-10b DNA	CCC TGT AGA ACC GAA TTT GTG T
crRNA	UAA CUG ACC GGG UCA UCU AAG UUU UAG AGC UAU GCU GUU UU
tracrRNA	AAA ACA GCA UAG CAA GUU AAA AUA AGG CUA GUC CGU UAU CAA CUU GAA AAA GUG GCA CCG AGU CGG UGC UUC G
crRNA-DNA	TAA CTG ACC GGG TCA TCT AAG TTT TAG AGC TAT GCT GTT TT
tracrRNA-DNA	AAA ACA GCA TAG CAA GTT AAA ATA AGG CTA GTC CGT TAT CAA CTT GAA AAA GTG GCA CCG AGT CGG TGC TTC G
miRNA-let-7a	UGA GGU AGU AGG UUG UAU AGU U
miRNA-222	CUC AGU AGC CAG UGU AGA UCC U
miRNA-141	UAA CAC UGU CUG GUA AAG AUG G
miRNA-107	AGC AGC AUU GUA CAG GGC UAU CA
miRNA-155	UUA AUG CUA AUC GUG AUA GGG GU

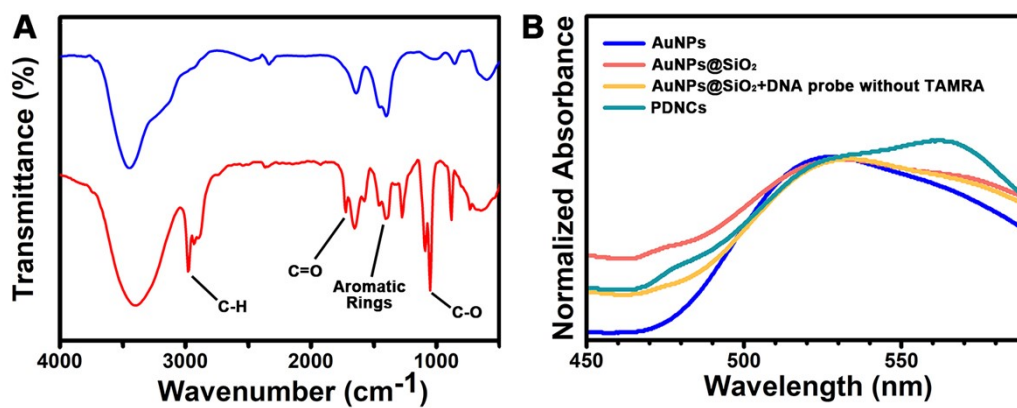


Figure S1 (A) FT-IR spectra of AuNPs (blue line) and the coronal structure nanoparticles (red line). The stretching and breathing vibration peaks of the groups were marked in the figure. (B) Absorption spectra of nanomaterials in different stages.

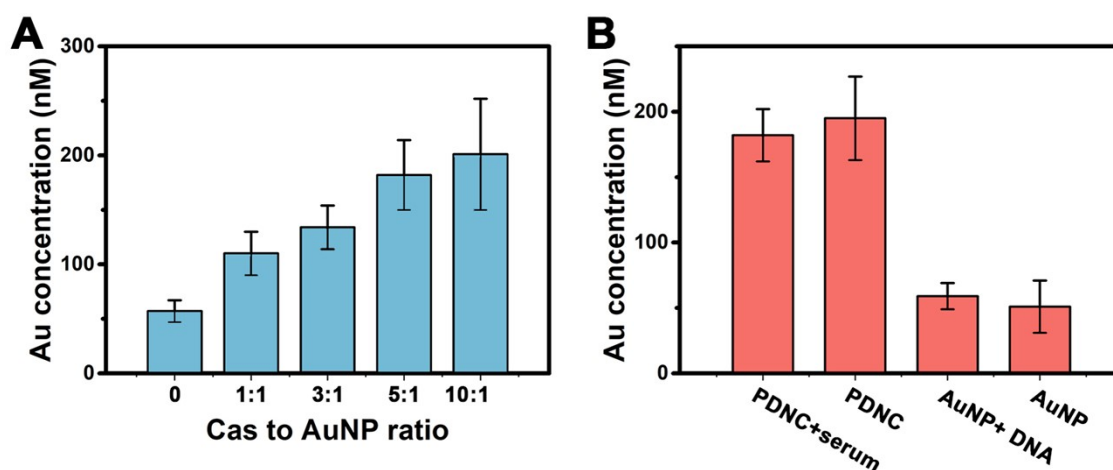


Figure S2 Cellular uptake of PDNCs. Quantification of cell uptake by measuring intracellular AuNPs using ICP-MS. MCF-7 cells were incubated for 4 h with PDNCs, which had (A) different Cas to AuNP ratio and (B) different environment.

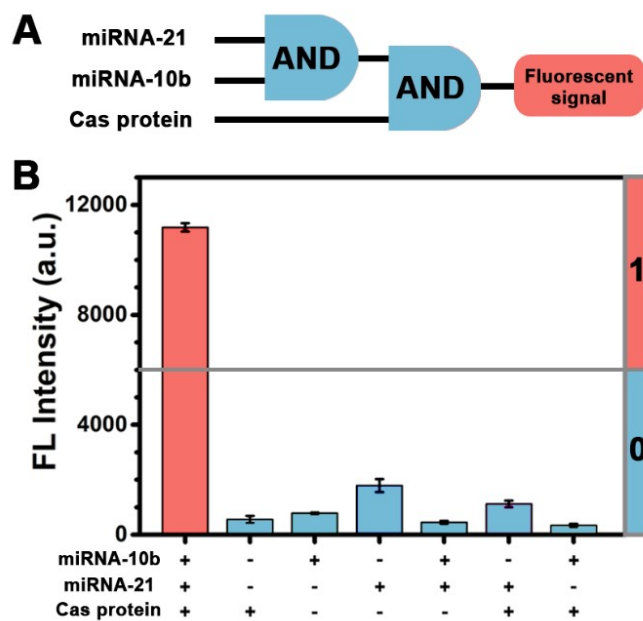


Figure S3 (A) Schematic of the multi-input design of AND logic gates. (B) Corresponding response of FL signal in each logic function design.

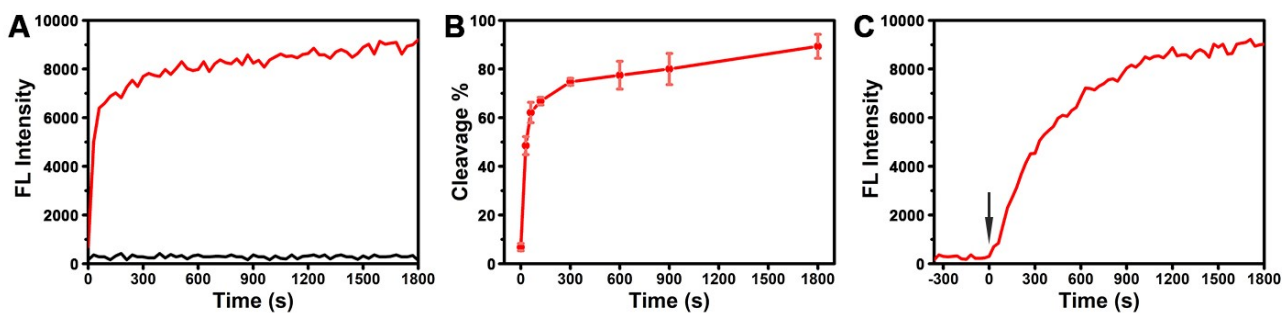


Figure S4 The FL intensity-Time chart after (A) Cas protein addition or (C) target mitomiR addition. (B) The cleavage kinetics of CRIPR/Cas system.

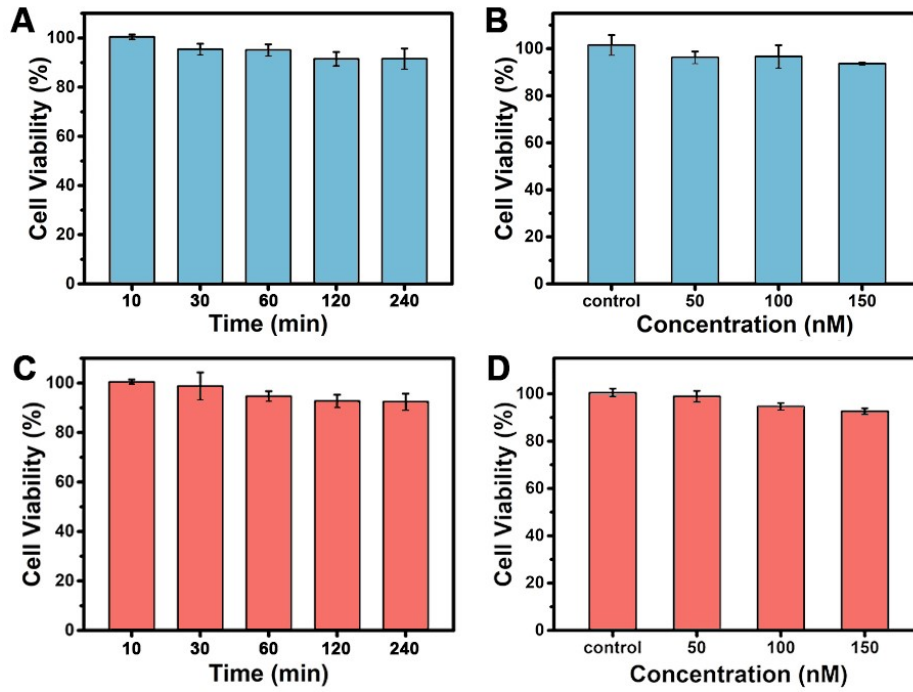


Figure S5 Cell viability of MCF-7 cells (A) incubated in different time, (B) incubated with different concentration of PDNCs in 30 mins (Consider one-tenth of the added Cas protein concentration as the concentration of PDNC).

Similar with 293T cells in (C) and (D).

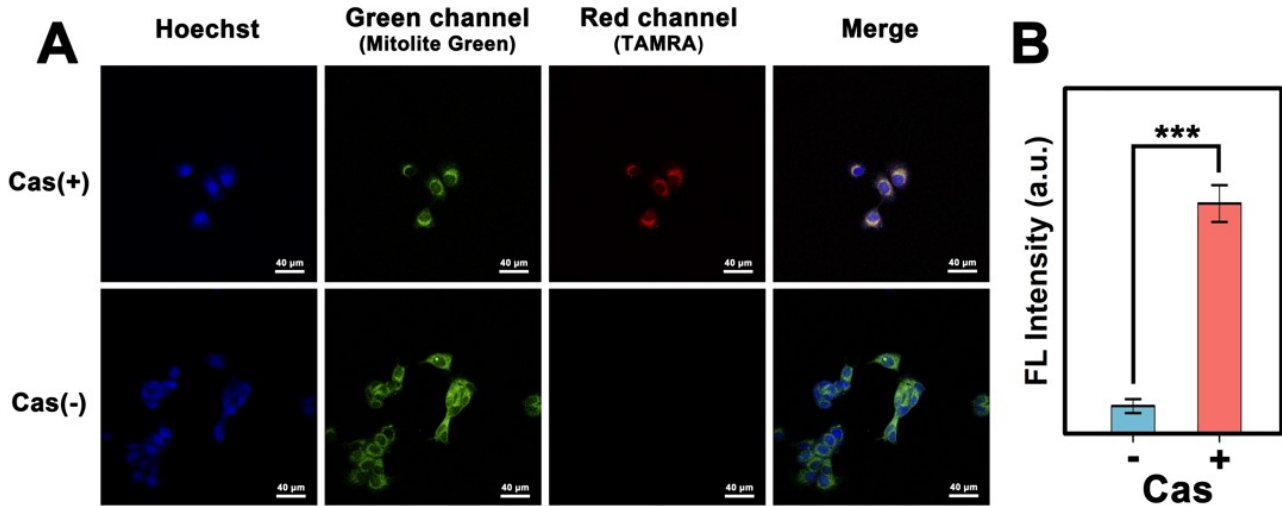


Figure S6 (A) CLSM images of MCF-7 cells incubated with PDNC probes with or without Cas protein. The scale bar is 40 μ m. (B) Histogram of the corresponding fluorescence intensity in red channel. Error bars indicate means

\pm SD (n=3). *** P <0.001.

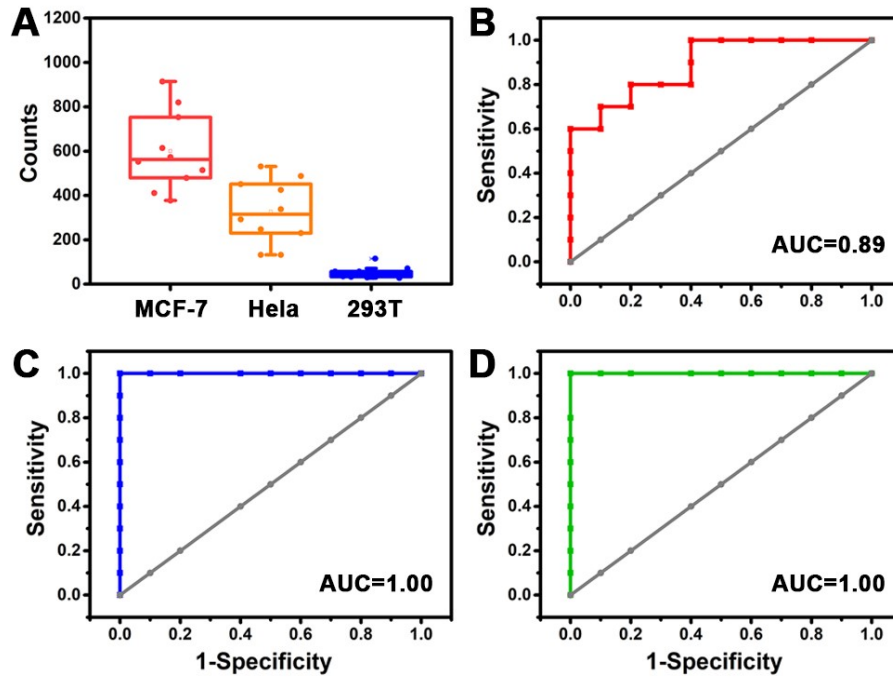


Figure S7 (A) Boxplot of the single dye molecular spot counts in different cells; ROC curve analysis of the (B) MCF-7 vs HeLa, (C) MCF-7 vs 293T and (D) HeLa vs 293T.

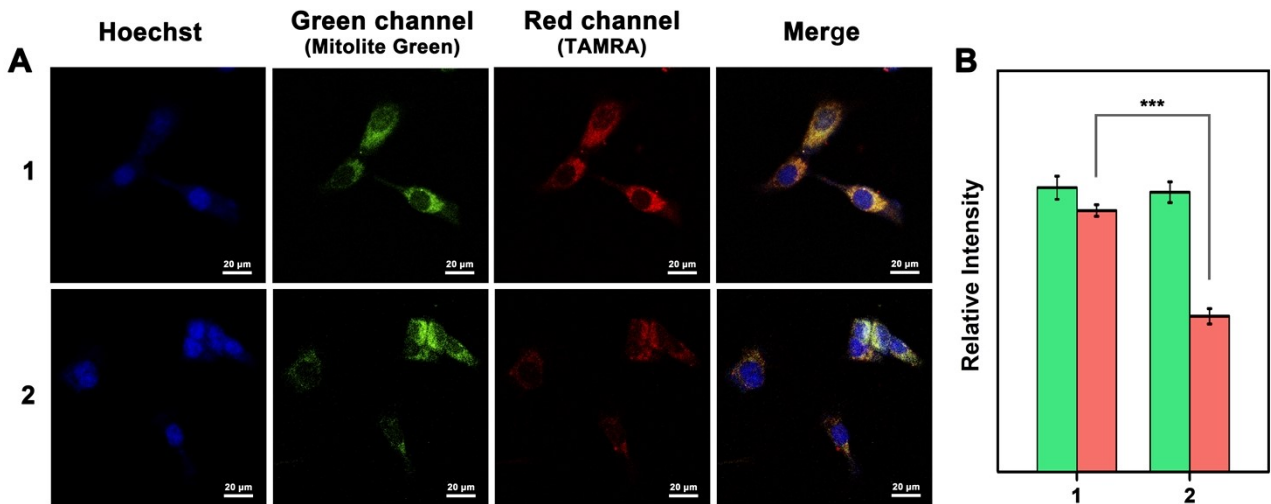


Figure S8 (A) CLSM images of MCF-7 cells 1) incubated with PDNC probes, 2) directly delivering RNA, DNA and proteins into cells. The scale bar is 20 μm. (B) Histogram of the corresponding fluorescence intensity in green and red channel. Error bars indicate means \pm SD (n=3). *** P <0.001.