Electronic Supplementary Information (ESI)

MnO_2 Nanosheet-Mediated Photo-Controlled DNAzyme for Intracellular miRNA Cleavage to Suppress Cell Growth

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Contents:

Table S1： Sequences used in this work.

Name	Sequences (5′ → 3′)
DNAzyme	TCAACATCAGTTCCGAGCCGGTCGAAGATAAGCTA
DNAzyme-dT	TCAACATCAGTTCCGAGCCGGTCGAAGATAAGCTAdT
FAM-DNAzyme-dT	FAM-TCAACATCAGTTCCGAGCCGGTCGAAGATAAGCTAdT
miRNA-21	UAGCUUAUCAGACUGAUGUUGA
FAM-miR-21-BHQ1	FAM - UAGCUUAUCAGACUGAUGUUGA-BHQ1
Cy3-miR-21-BHQ2	Cy3- UAGCUUAUCAGACUGAUGUUGA-BHQ2
FAM-PD -BHQ1	FAM-TAGCTT/iPCLink/ATCAGACTGATCAACTTTTTTTCAACATCAGTTCC GAGCCGGTCGAAGATAAGCTA-BHQ1
miR-21 forward	ACACTCCAGCTGGGTAGCTTATCAGACTGA
miR-21 reverse	CTCAACTGGTGTCGTGGAGTCGGCAATTCA GTTGAGTCAACATC
U6 forward	CTCGCTTCGGCAGCACA
U6 reverse	AACGCTTCACGAATTTGCGT

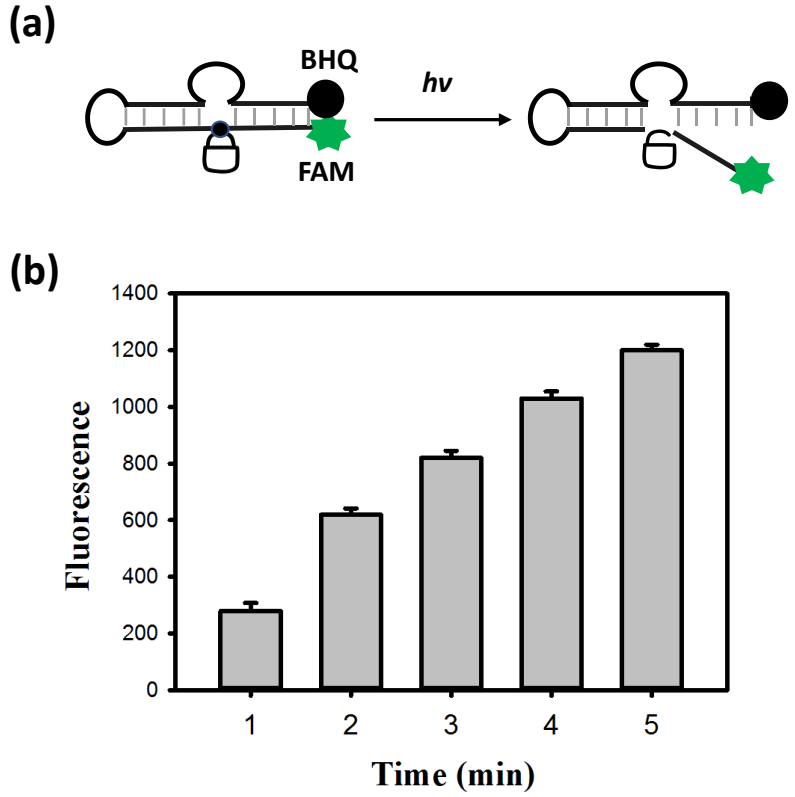

Figure S1. Fluorescence analysis of the PD response to UV light. (a) Schematic depicting the mechanism of the photo-responsive of PD. (b) Real-time fluorescence monitoring of the PD shining with UV light.

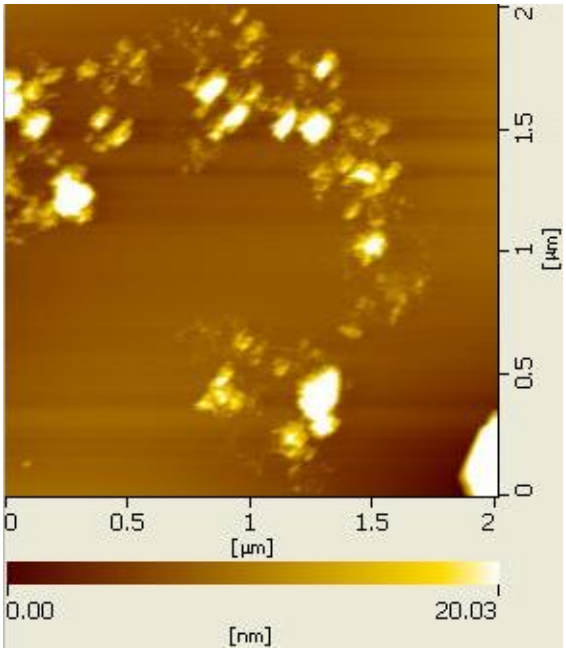

Figure S2. Atomic force microscopy (AFM) images of the MnO_2 nanosheets.

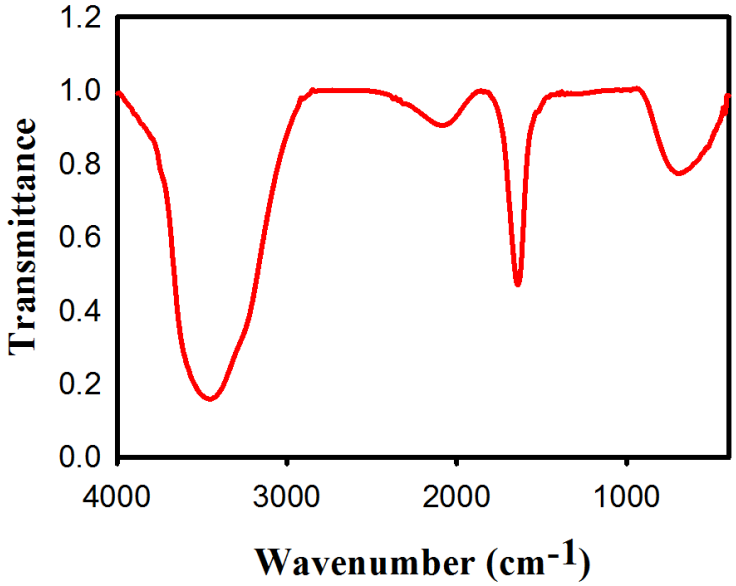

Figure S3. Infrared (IR) spectrum of the MnO_2 nanosheets. The absorption peak below 1000 denotes a band of Mn-O.

			Mean (mV)	Area (%)	Width (mV)
Zeta Potential (mV):	-30.1	Peak 1:	-30.1	100.0	7.53
Zeta Deviation (mV):	7.53	Peak 2:	0.00	0.0	0.00
Conductivity (mS/cm):	0.167	Peak 3:	0.00	0.0	0.00

Result quality : See result quality report

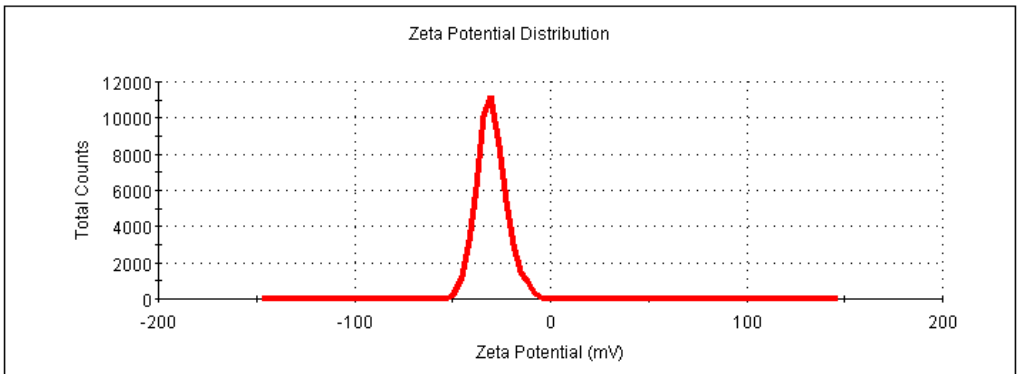

Figure S4. Zeta-potential analysis of the MnO_2 nanosheets.

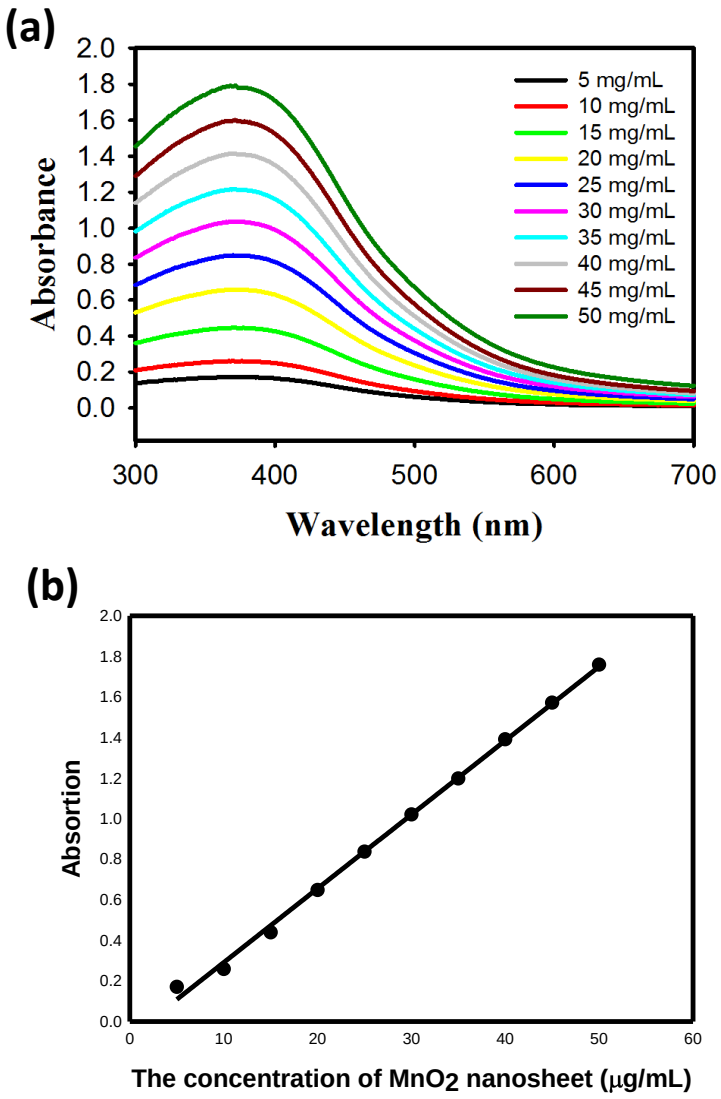

Figure S5. Quantitative analysis of the MnO_2 nanosheets. (a) The UV-Vis absorption spectra of different concentrations of the MnO_2 nanosheets. (b) The standard curve can be drawn for quantitative analysis of MnO_2 nanosheets.

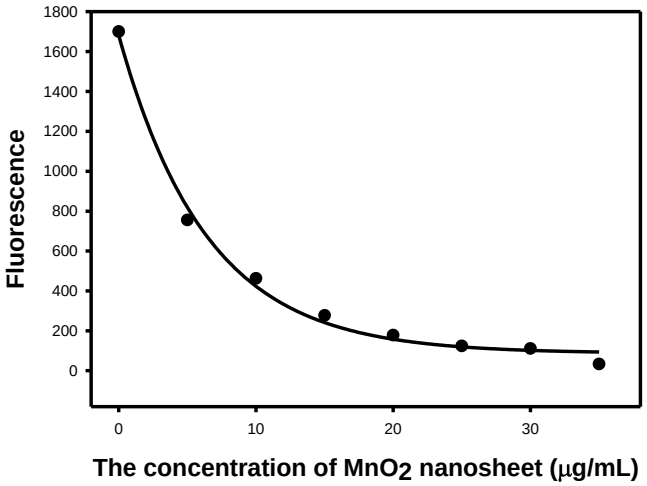

Figure S6. Fluorescence quenching analysis. The experiment of quenching fluorescence by different concentrations of MnO_2 nanosheets and 100 nM PD.

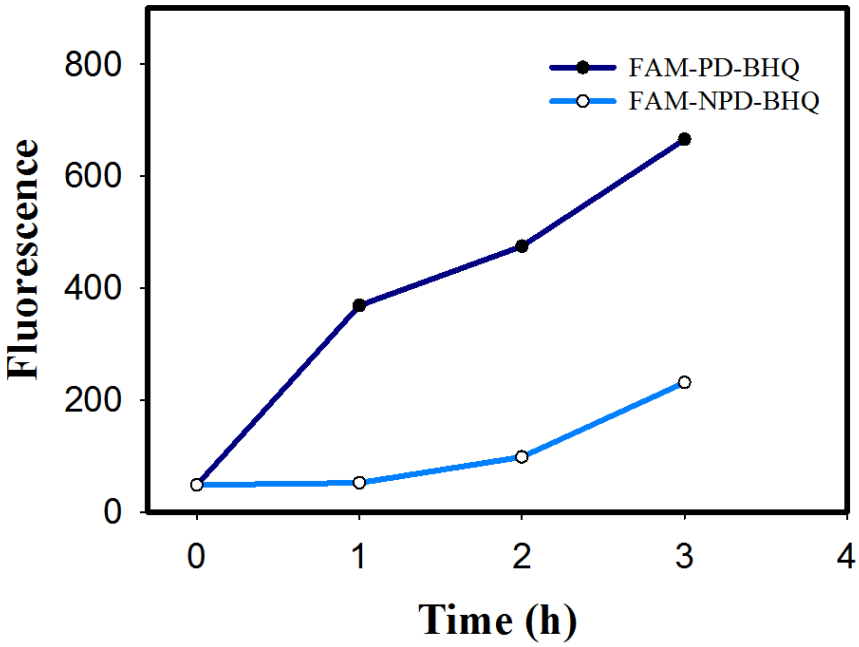

Figure S7. The stability test of the PD and NPD by fluorescence analysis. FAM-PD-BHQ and FAM-NPD-BHQ incubated with DNase I.

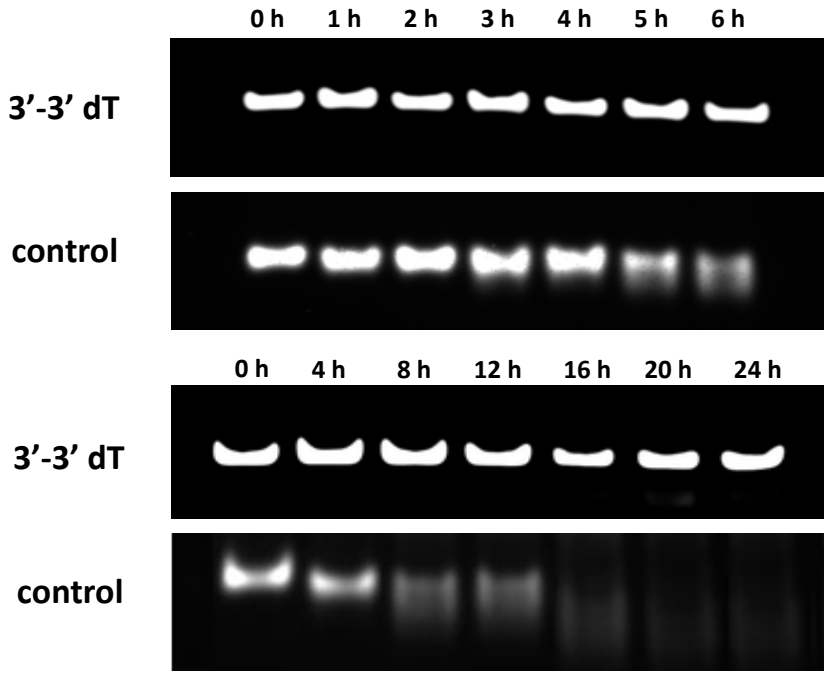

Figure S8. The stability test of the modified PD with 3’-3’-dT cap in FBS. Control denotes PD without 3’-3’-dT cap.

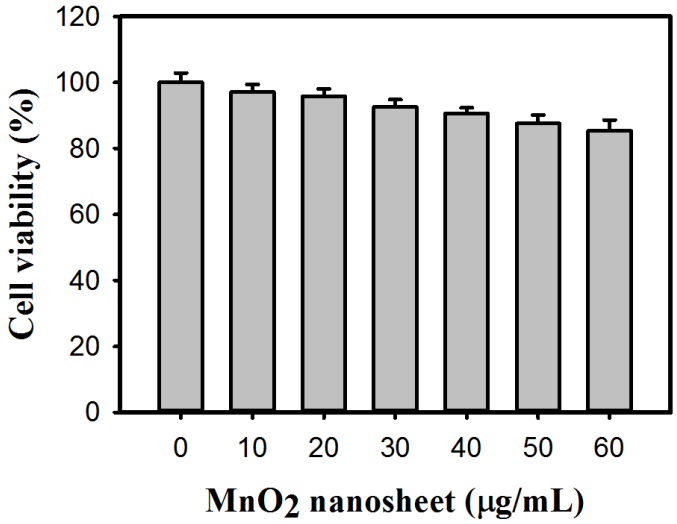

Figure S9. Cytotoxicity of different concentrations of MnO_2 nanosheets. All the experiments were done three times in parallel.