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Peptide nucleic acid-functionalized carbon nitride nanosheet as a probe for in situ monitoring of intracellular microRNA †

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Supplementary figures

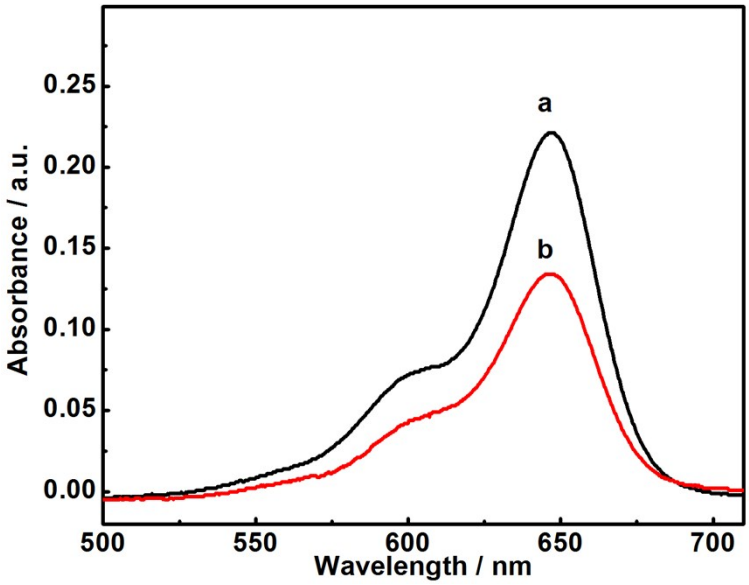

Fig. S1 UV-visible absorption spectra of 500 nM Cy5-PNA (a) in the presence of 350 μg mL^{-1} CNNS (b), curve (b) was measured using 350 μg mL^{-1}CNNS as blank.

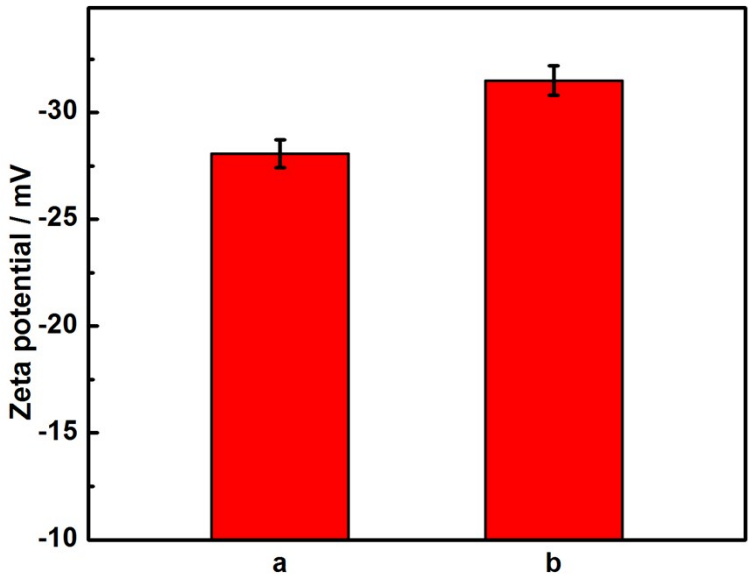

Fig. S2 Zeta potentials of PNA-CNNS (a) and f-CNNS probe (b).

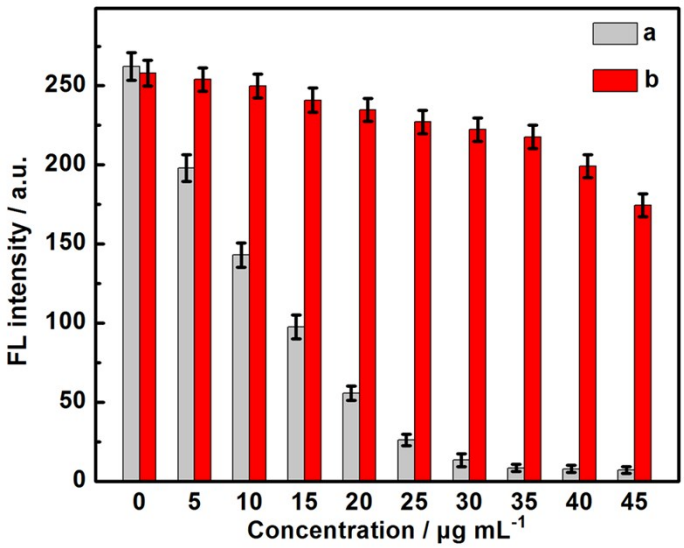

Fig. S3 FL intensity of (A) 50 nM Cy5-PNA after incubation with 0, 5, 10, 15, 20, 25, 30, 35, 40 and 45 μg mL^{-1} CNNS for 5 min (a) and then 250 nM miRNA-18a at 37 ^{o}C for 1 h (b). All measurements are performed in HB.

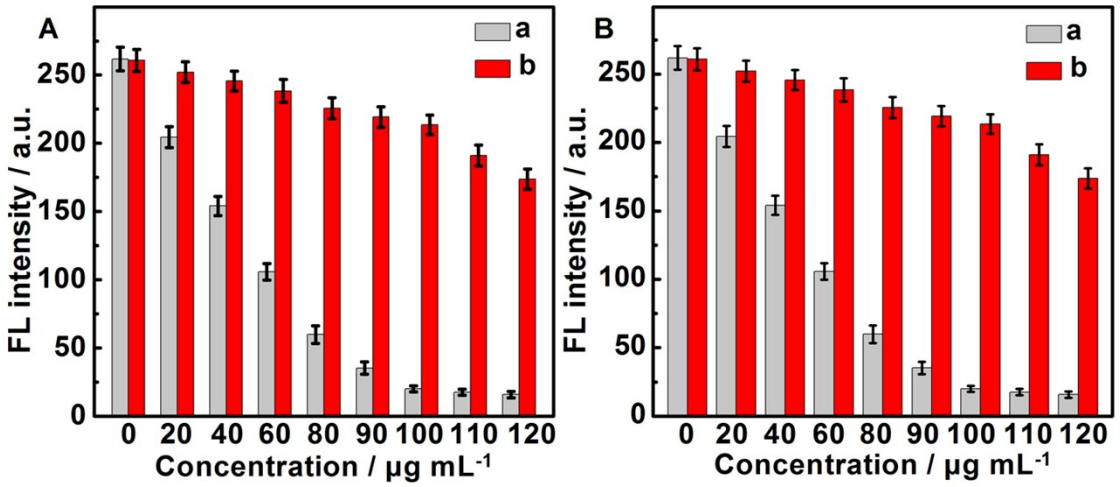

Fig. S4 FL intensity of 50 nM Cy5-LNA (A) or Cy5-ssDNA (B) after incubation with 0, 20, 40, 60, 80, 90, 100, 110 and 120 μg mL^{-1} CNNS for 5 min (a) and then 250 nM miRNA-18a at 37 °C for 1 h (b), respectively. All measurements are performed in HB.

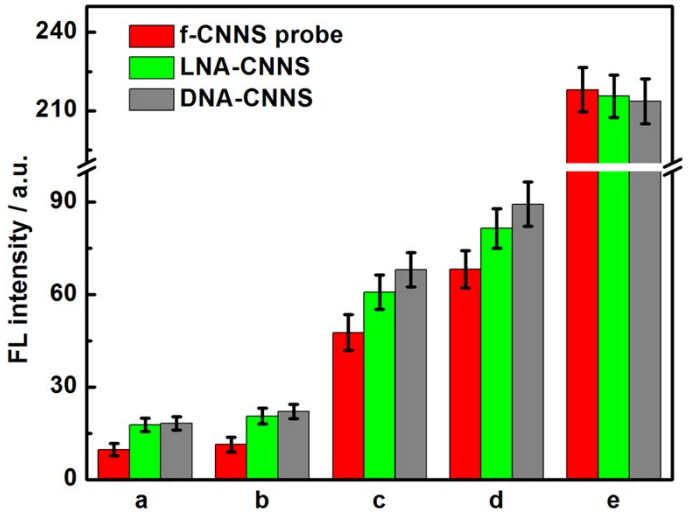

Fig. S5 FL intensity of f-CNNS probe, LNA-CNNS and DNA-CNNS (a) after incubation with 250 nM non-complementary RNA (b), three-base mismatched strand (c), single-base mismatched strand (d) and miRNA-18a (e) at 37 °C for 1 h. The concentration of f-CNNS probe, LNA-CNNS and DNA-CNNS were 35, 100 and 100 μg mL^{-1}, respectively. All measurements are performed in HB.

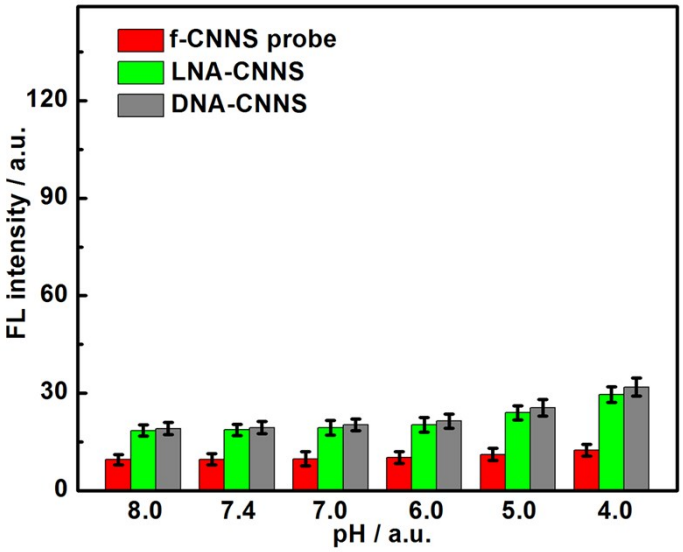

Fig. S6 FL intensity of f-CNNS probe, LNA-CNNS and DNA-CNNS in pH 4.0, 5.0, 6.0, 7.0, 7.4 and 8.0 buffer solution. The concentration of f-CNNS probe, LNA-CNNS and DNA-CNNS were 35, 100 and 100 μg mL^{-1}, respectively.

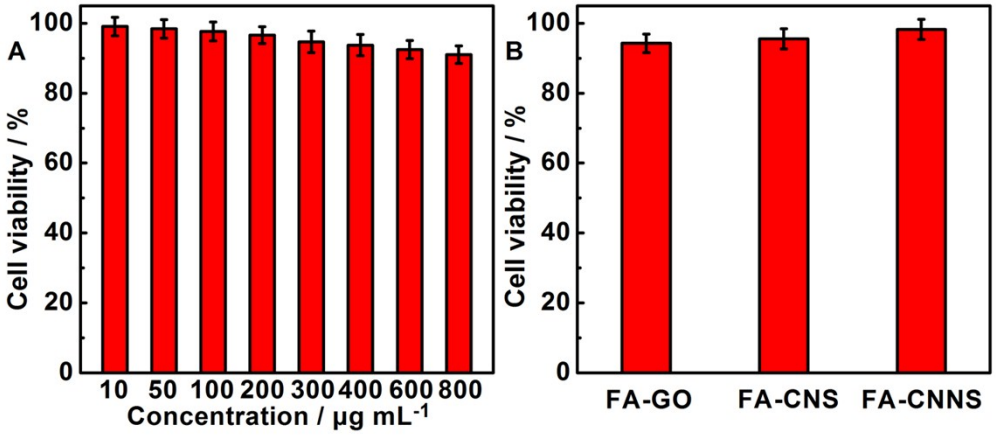

Fig. S7 Viability of HepG2 cells after incubation with (A) 10, 50, 100, 200, 300, 400, 600 or 800 μg mL^{-1} FA-CNNS, and (B) 35 μg mL^{-1} FA-CNNS, FA-CNS or FA-GO at 37 ^{o}C for 3 h.

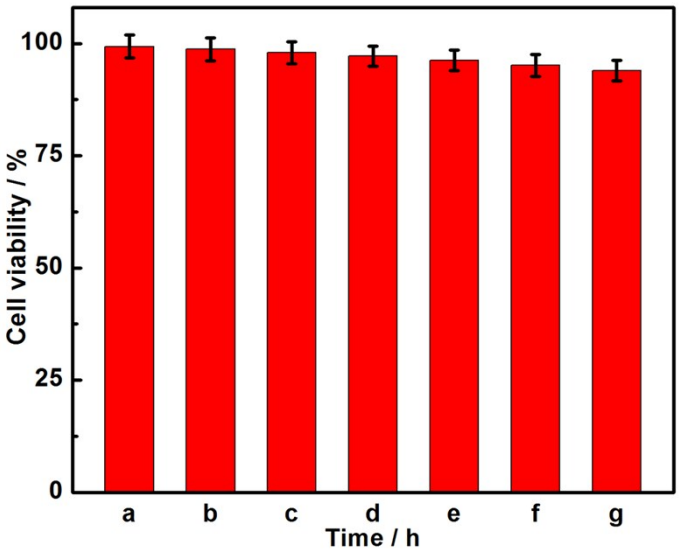

Fig. S8 Viability of HepG2 cells after incubated with 35 μg mL^{-1} f-CNNS probe at 37 °C for 1, 2, 3, 4, 6, 9 and 12 h (from a to g).

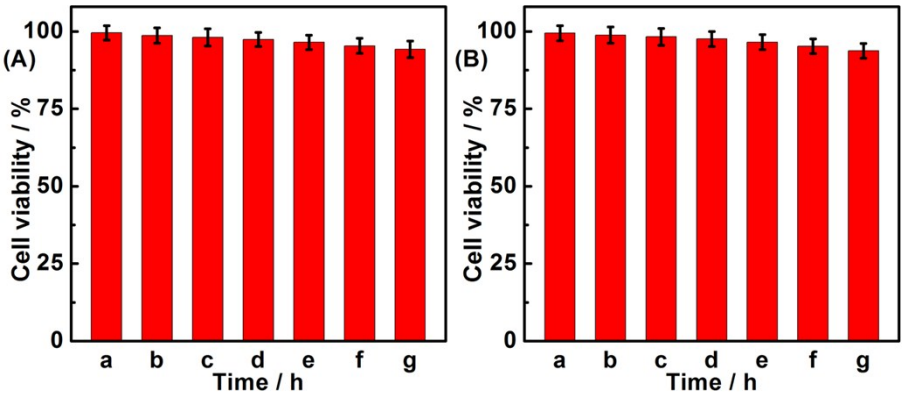

Fig. S9 Viability of HeLa (A) and MDA-MB-231 (B) cells after incubated with 35 μg mL^{-1} f-CNNS probe at 37 °C for 1, 2, 3, 4, 6, 9 and 12 h (from a to g).

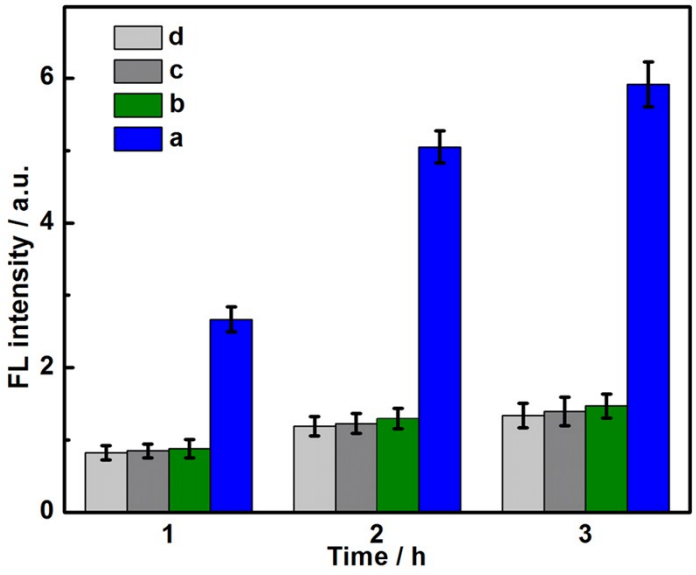

Fig. S10 Confocal FL intensity of HepG2 cell transfected with 35 μg mL^{-1} (a) FA-CNNS and (b) CNNS, and (c) A549 and (d) HaCaT cell transfected with 35 μg mL^{-1} FA-CNNS at 37 ^{o}C for 1, 2 and 3 h.

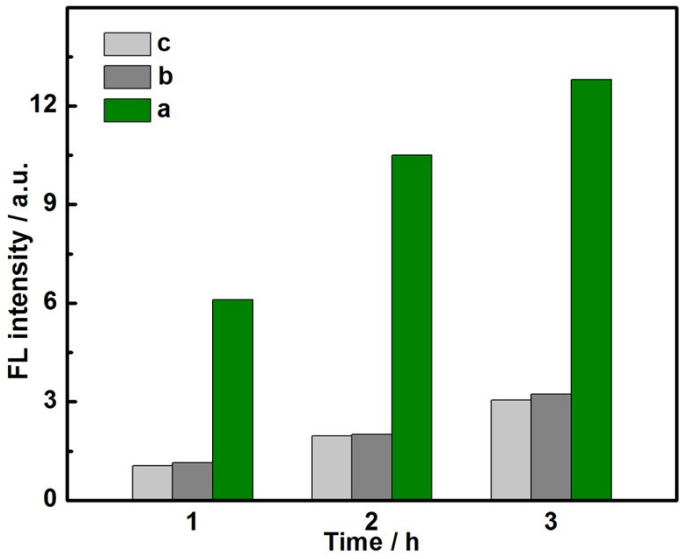

Fig. S11 FL intensity from flow cytometric analysis of (a) HepG2 and (b) FR-saturated HepG2 cells transfected with 35 μg mL^{-1} f-CNNS probe, (c) HepG2 cells transfected with 35 μg mL^{-1} PNA-CNNS at 37 ^{o}C for 1, 2 and 3 h.

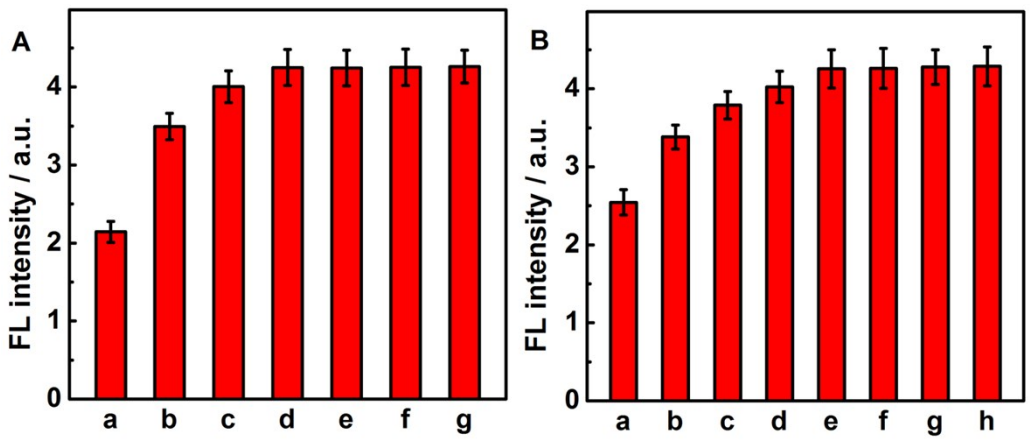

Fig. S12 Confocal Cy5 FL intensity of HepG2 cell after incubation with (A) 35 μg mL^{-1} f-CNNS probe at 37 °C for 1.0, 2.0, 2.5, 3.0, 3.5, 4.0 and 5.0 h (from a to g), (B) 10, 20, 25, 30, 35, 40, 45 and 50 μg mL^{-1} f-CNNS probe at 37 °C for 3 h (from a to h).

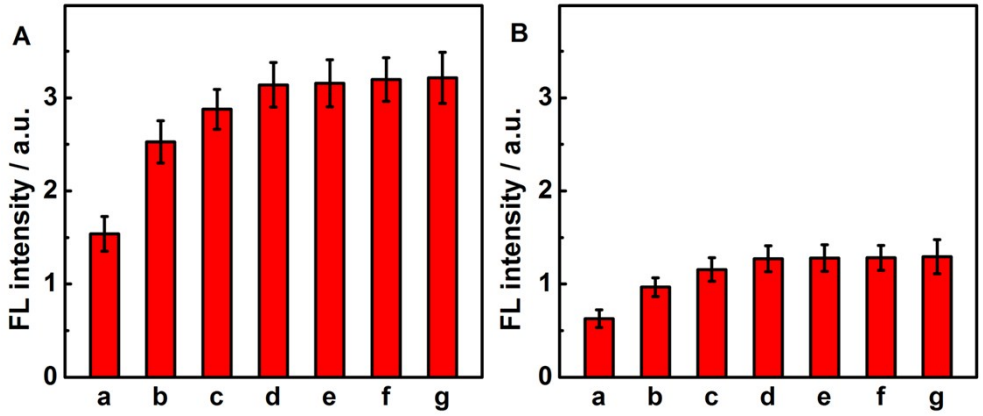

Fig. S13 Confocal Cy5 FL intensity of HeLa (A) and MDA-MB-231 (B) cells after incubated with 35 μg mL^{-1} f-CNNS probe at 37 °C for 1.0, 2.0, 2.5, 3.0, 3.5, 4.0 and 5.0 h (from a to g).

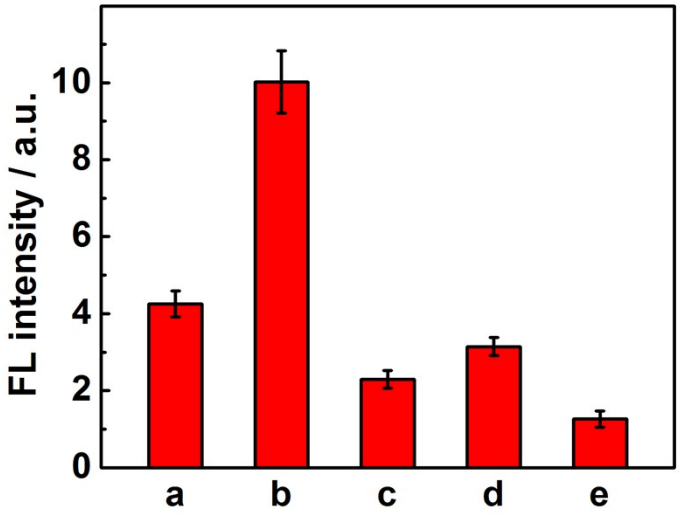

Fig. S14 FL intensity of Cy5 from confocal microscopic analysis of HepG2 cells (a), HepG2 cells treated with 50 nM inhibitor-18a (b) and 5 nM miRNA-18a mimic (c) for 48 h, HeLa (d) and MDA-MB-231 (e) transfected with 35 μg mL^{-1} f-CNNS probe at 37 ^{o}C for 3 h.

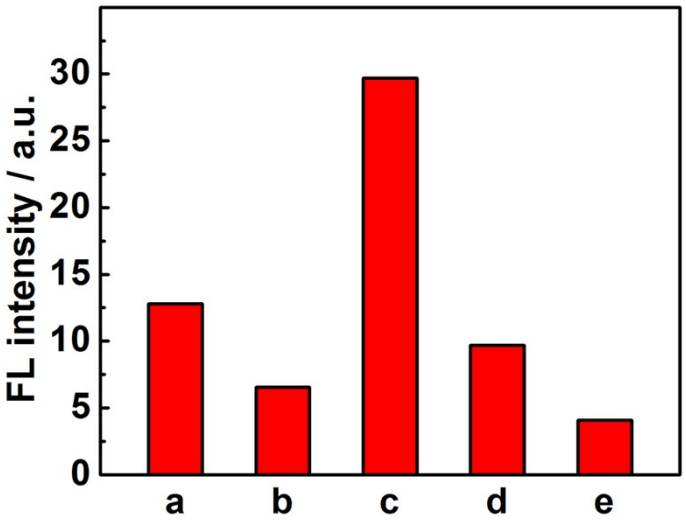

Fig. S15 FL intensity of Cy5 from flow cytometric analysis of HepG2 cells (a), HepG2 cells treated with 50 nM inhibitor-18a (b) and 5 nM miRNA-18a mimic (c) for 48 h, HeLa (d) and MDA-MB-231 (e) transfected with 35 μg mL^{-1} f-CNNS probe at 37 ^{o}C for 3 h.

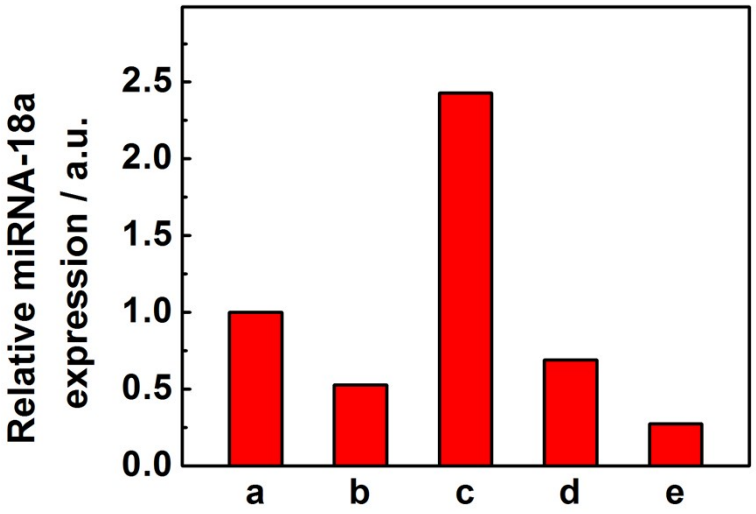

Fig. S16 Relative expression of miRNA-18a from quantitative real-time PCR analysis of HepG2 cells (a), HepG2 cells treated with 50 nM inhibitor-18a (b) and 5 nM miRNA-18a mimic (c) for 48 h, HeLa (d) and MDA-MB-231 (e) cells transfected with 35 μg mL^{-1} f-CNNS probe at 37 ^{o}C for 3 h.