# Supporting Information

# Dynamic Tracking of p21 mRNA in Living Cells by Sticky-Flares for Visual Evaluation of Tumor Treatment Effect

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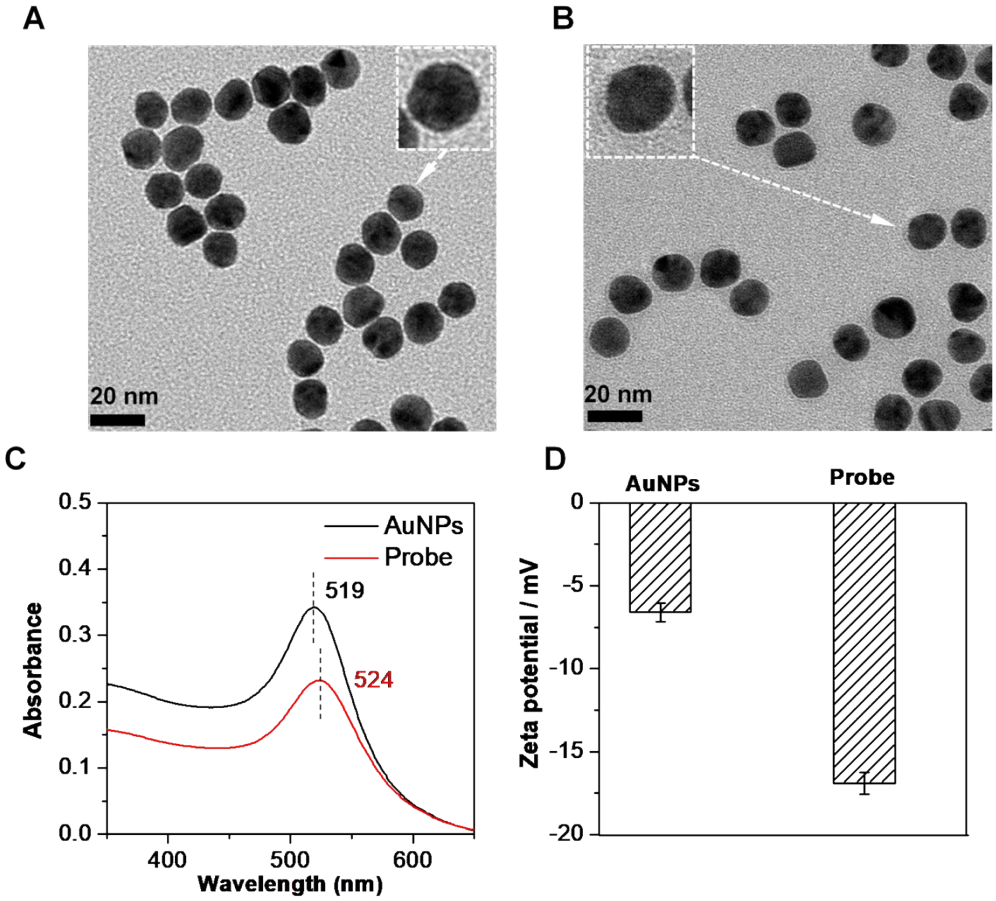



**Figure S1.** Characterization of AuNPs and sticky-flare. TEM micrographs of (A) AuNPs and (B) sticky-flare. (C) UV-vis absorption spectra of the AuNPs (black curve) and the sticky-flare (red curve). (D) Zeta potentials of AuNPs and sticky-flare in $H_2O$.

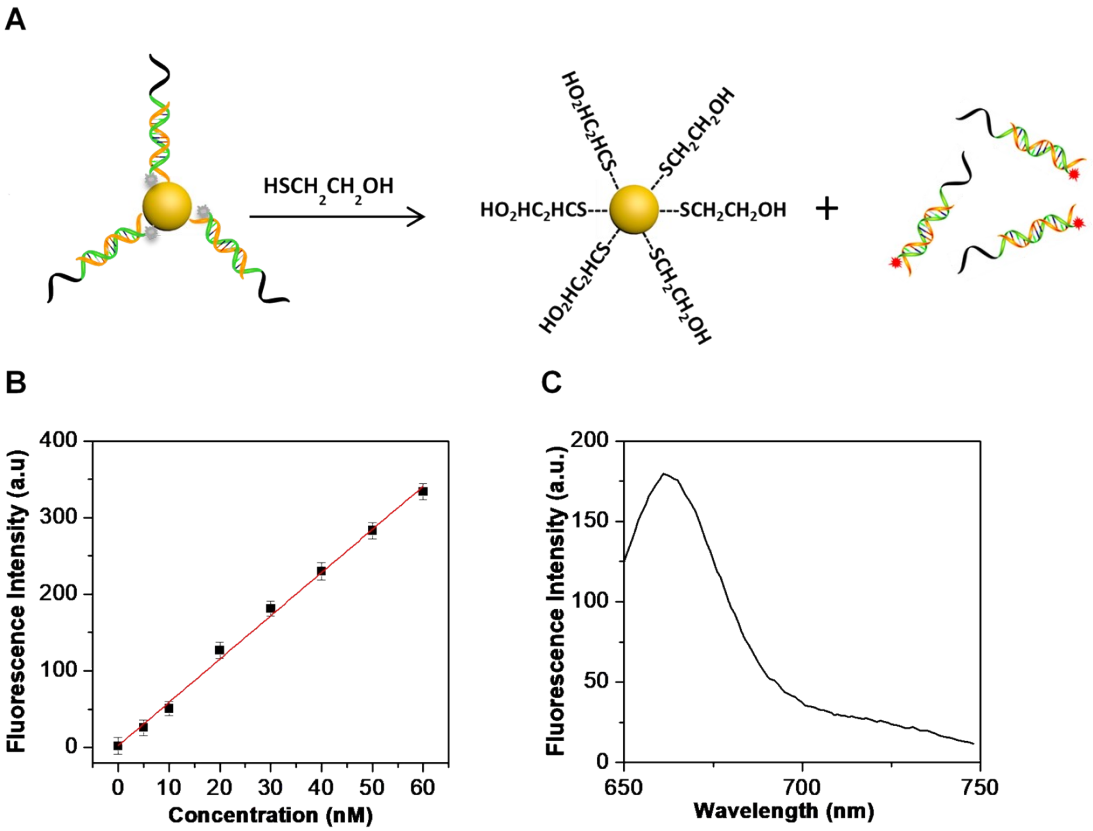



**Figure S2.** Quantification of DNA on each AuNPs. (A)Schematic diagram of the mechanism. (B) Linear relationship of standard curve of FL-strand. (C) Fluorescence intensity in supernatant containing FL-strand.

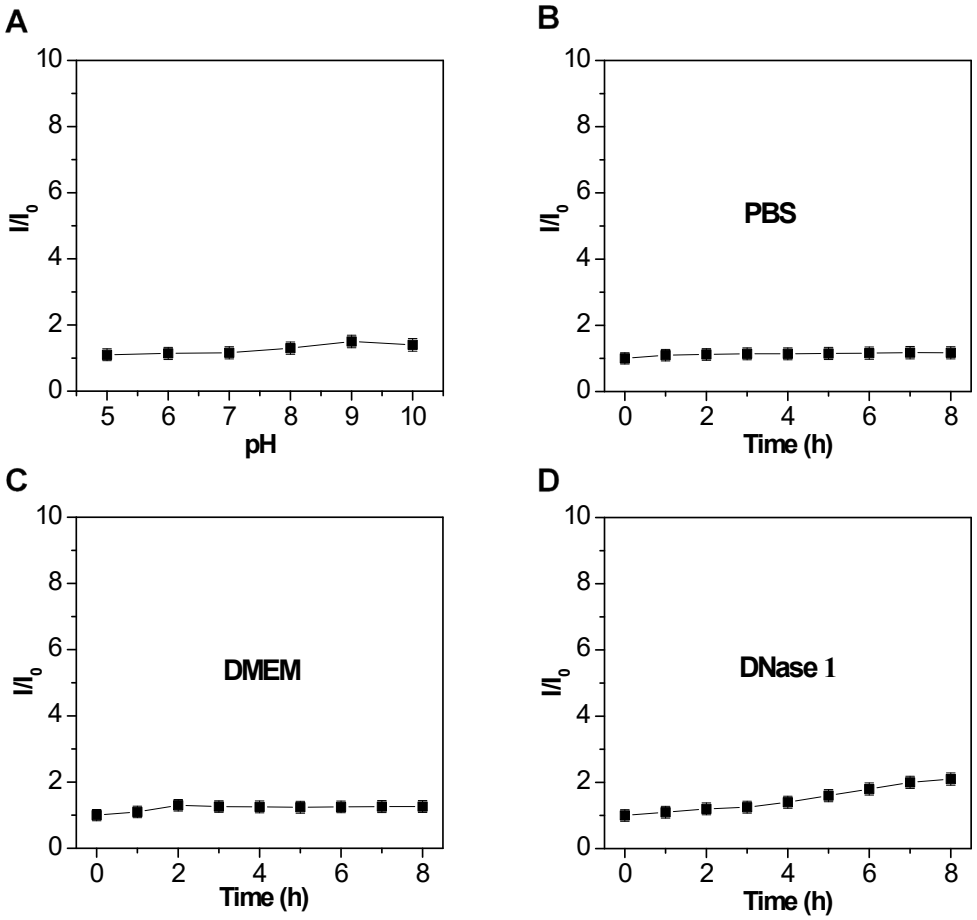



**Figure S3.** The sticky-flare stability characterization against environmental factors. (A) The sticky-flare stability in different pH. The stability of the sticky-flare in different buffers (B) PBS (C) DMEM (D) DNase I. Fluorescent enhancement factor plotted against time. The error bars represent standard deviation (± SD) from three independent tests.

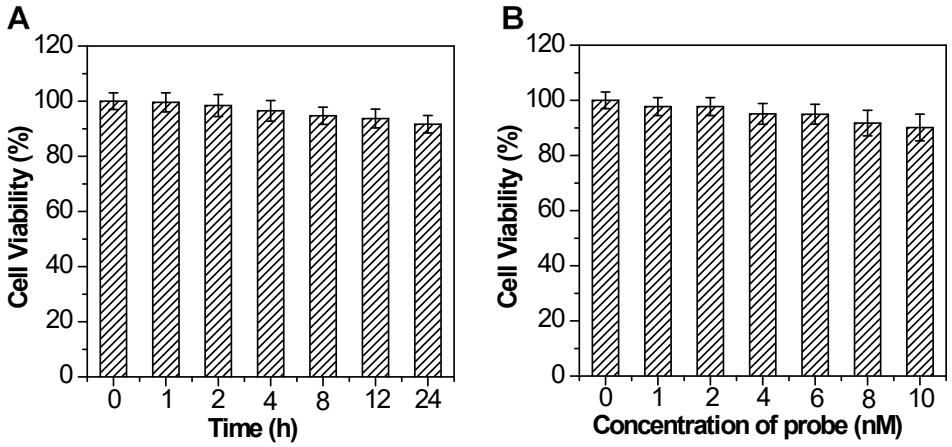



**Figure S4.** The feasibility of detecting HepG2 cells in the presence of sticky-flare by MTT. (A) Cell viability of 6 nM sticky-flare and cell incubation at different time (0, 1, 2, 4, 8, 12 and 24 h). (B) The viability of cells incubated with different concentrations (0, 1, 2, 4, 6, 8 and 10 nM) of sticky-flare for 4 hours. The error bar represents the standard deviation of three independent tests (± SD).

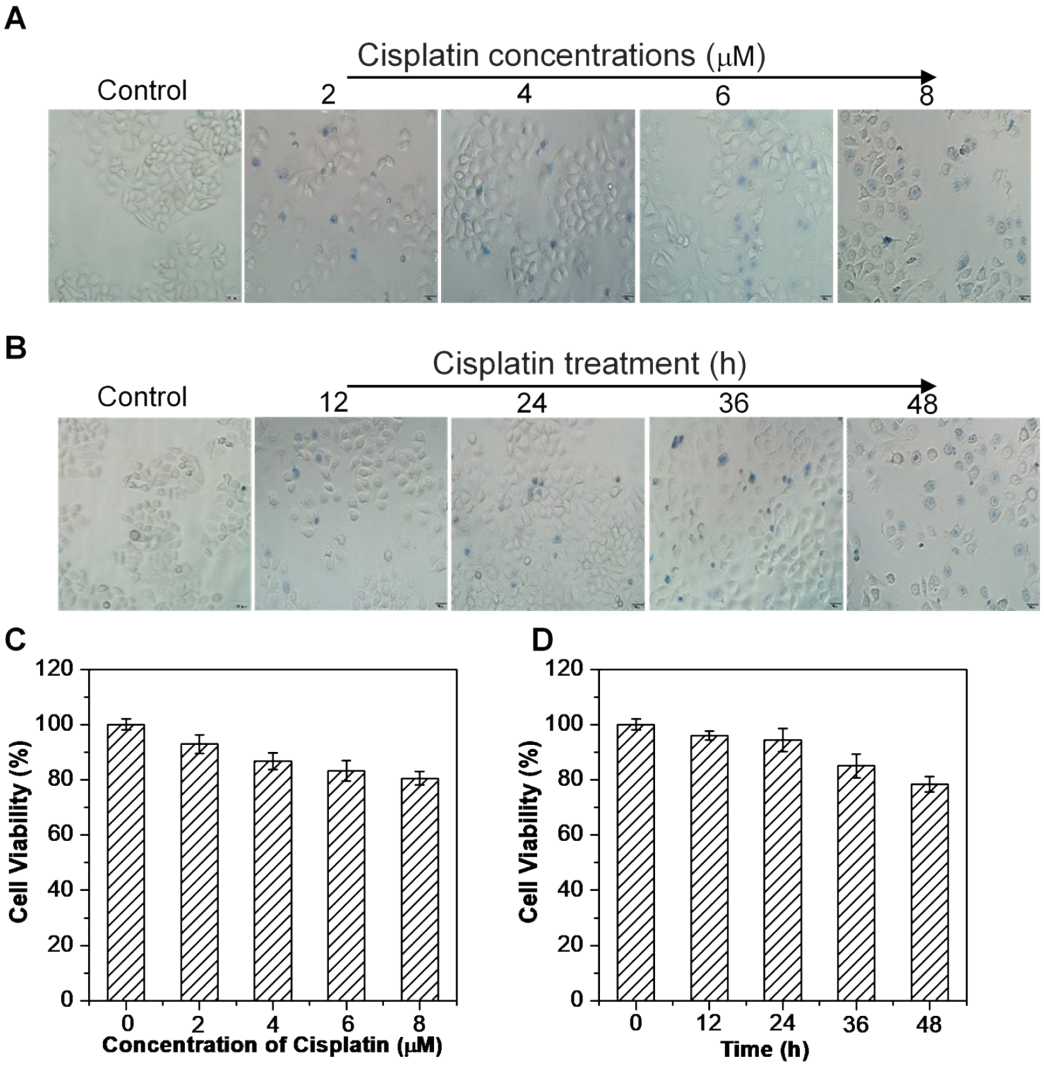



**Figure S5.** Cell viability of HepG2 cells after cisplatin treatment with MTT. (A) Different concentrations (0, 2, 4, 6 and 8 μM) of cisplatin treatment at different times (B) (0, 12, 24, 36 and 48 h) by trypan blue staining under the microscope to observe the picture. Cell viability of cisplatin and cell incubation at different concentrations (C) and different time (D).

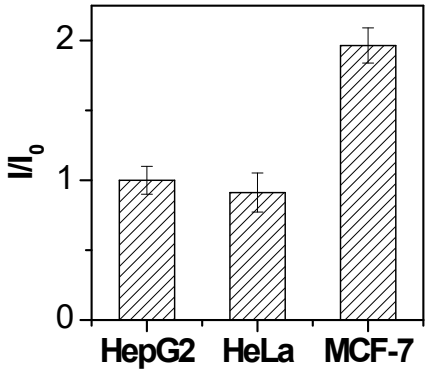



**Figure S6**. Fluorescence intensity enhancement factor ($I/I_0$) vs. different cancer cells (HepG2, HeLa, MCF-7).

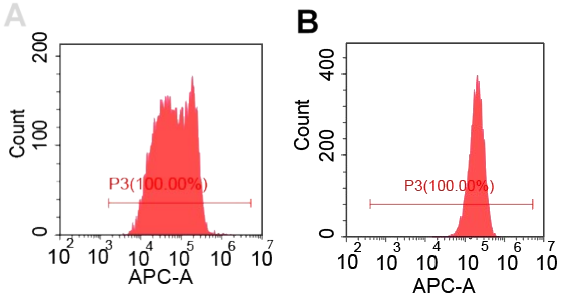



**Figure S7.** Flow cytometric analyses different cells (A) HepG2, (B) MCF-7 treated with sticky-flare for 4h.

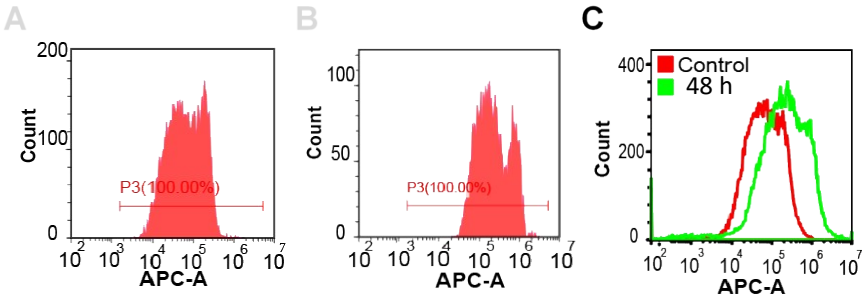
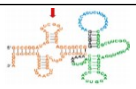
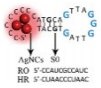
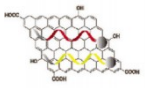
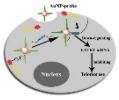
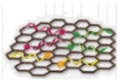
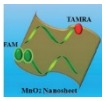



**Figure S8.** Flow cytometry analyzes the fluorescence changes of 8 μM cisplatin treated HepG2 after (A) 0 h and (B) 48 h of incubation time with the sticky-flare probe for 4 hours. (C) Fluorescence comparison between control and 48 h.

**Table S1.** Comparison of recently reported methods based on nano-materials for detections of mRNA.[1-9]

| Materials | Linear range | Detection limit | Mechanism | Sample | Reference |
|---|---|---|---|---|---|
| nucleic acid sequence | 0-100 nM | 0.3 nM |  | miR-21 RNA | 1 |
| nucleic acid sequence | 0-300 nM | 5.4 nM |  | hTR | 2 |
| nucleic acid sequence | 0.5-2.5nM | 3 nM |  | Survivin DNA | 3 |
| AgNCs modified nucleic acid sequence | 25-250 nM | 20 nM |  | hTR | 4 |
| rGO modified nucleic acid sequence | 0-100 nM | 0.46 nM<br>0.71 nM |  | p21 mRNA<br>p53 mRNA | 5 |
| AuNPs modified nucleic acid sequence | 0-400 nM | 4.355 nM |  | hTERT | 6 |
| GO modified nucleic acid sequence | 0-400 nM | 0.26 nM<br>1.04 nM<br>1.15 nM |  | C-myc mRNA<br>TK1 mRN<br>Actin mRN | 7 |
| AuNPs modified nucleic acid sequence | 0-200 nM | 0.3 nM<br>0.5 nM |  | Survivin DNA<br>cyclin D1 DNA | 8 |
| $MnO_2$ modified nucleic acid sequence | 0-100 nM | 1 nM |  | TK1 mRN | 9 |
| sticky-flare probe | 0-100 nM | 0.57 nM |  | p21 mRNA | This work |

## References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