Electronic Supplementary Information

Sticky-Flares for in situ Monitoring of Human Telomerase RNA in Living Cells

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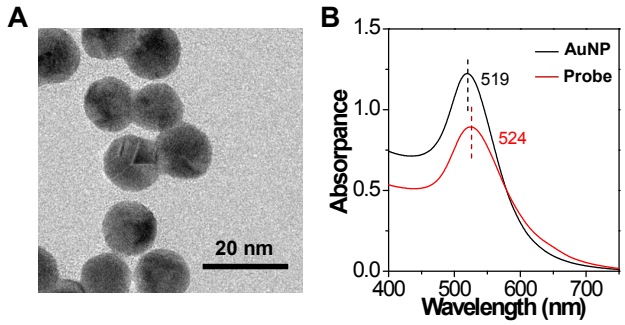

Fig. S1. Characterization of sticky-flares probe**.** (A) TEM micrograph of ~13 nm AuNPs. (B) UV-vis absorption spectra of AuNPs (black line) and sticky-flares probe (red line).

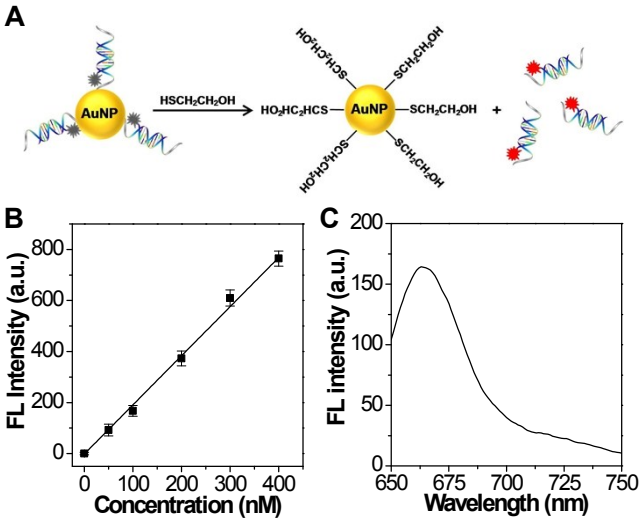

Fig. S2. Quantification of the amounts of duplex DNA strands loaded at each AuNP. (A) Standard linear calibration curve of fluorescence intensity against the concentration of Cy5 labeled FL-R flares. (B) The fluorescence spectrum of supernatant containing Cy5 labeled FL-R flares.

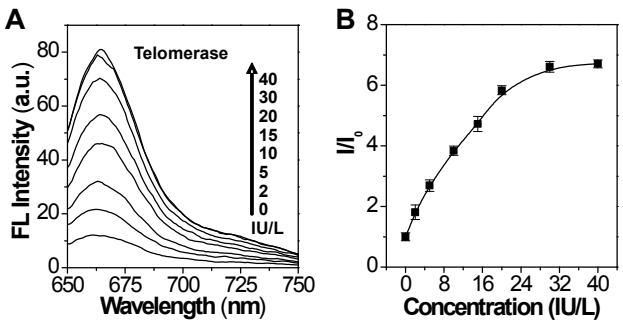

Fig. S3. (A) Fluorescent spectra of sticky-flares probe incubated with various concentration of commercial pure telomerase. (B) Fluorescent enhancement factors plotted against telomerase concentration. The error bars represent standard deviation (± SD) from three independent tests.

A

Sequence of SH-C strand

17 bp: SH-AAAAAAAGAAGAGTCAA-5′

21 bp: SH-AAAAAAAGAAGAGTCAATCCC-5′

22 bp: SH-AAAAAAAGAAGAGTCAATCCCA-5′

23 bp: SH-AAAAAAAGAAGAGTCAATCCCAA-5′

27 bp: SH-AAAAAAAGAAGAGTCAATCCCAATCTG-5′

B

Sequence of –FL-R flare

25 bp: Cy5-CTT CTCAGTTAGGGTTAGACAAAAA-3′

29 bp: Cy5-CTT CTCAGTTAGGGTTAGACAAAAAATGG-3′

30 bp: Cy5-CTT CTCAGTTAGGGTTAGACAAAAAATGGC-3′

31 bp: Cy5-CTT CTCAGTTAGGGTTAGACAAAAAATGGCC-3′

35 bp: Cy5-CTT CTCAGTTAGGGTTAGACAAAAAATGGCCACCA-3′

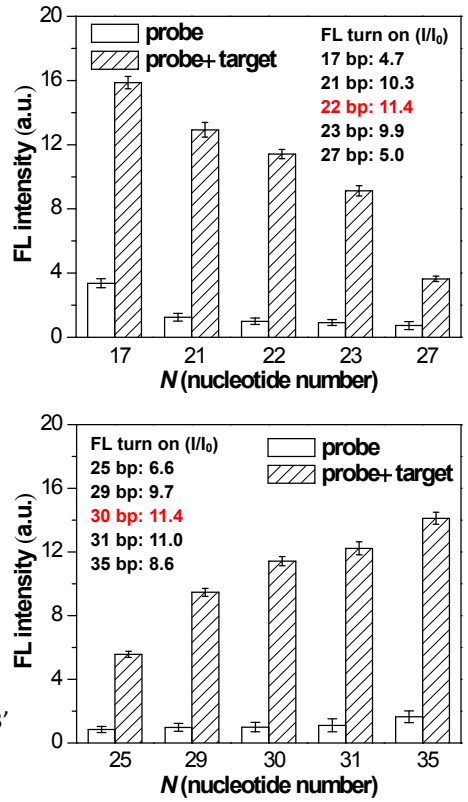

Fig. S4. Optimization of the sticky-flares probe. (A) Five SH-C Strands of different length (17, 21, 22, 23 and 27 bases) and (B) Five FL-R flares of different length (25, 29, 30, 31 and 35 bases) were tested and the fluorescent intensities of the probes with or without target DNA were analyzed.

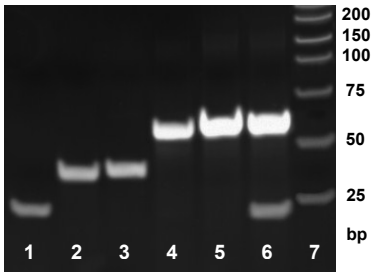

Fig. S5. Conformation of the detection mechanism by gel electrophoresis. (1) SH-C strands without SH, (2) FL-R flares, (3) target DNA, (4) dsDNA 1(1+2), (5) dsDNA 2 (2+3), and (6) dsDNA 1 incubated with target DNA.

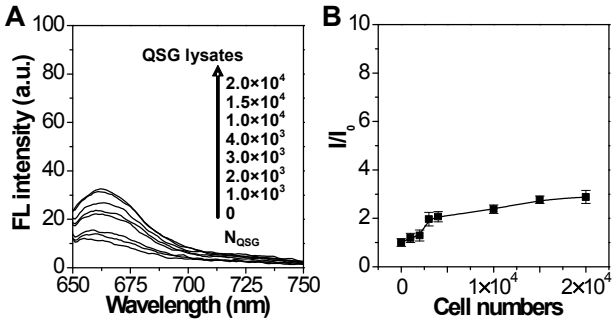

Fig. S6. (A) Fluorescent spectra of sticky-flares probe after incubation with QSG cell lysates containing different cell numbers. (B) Plot of fluorescence intensity ratio (I/I_0) vs QSG cell numbers.

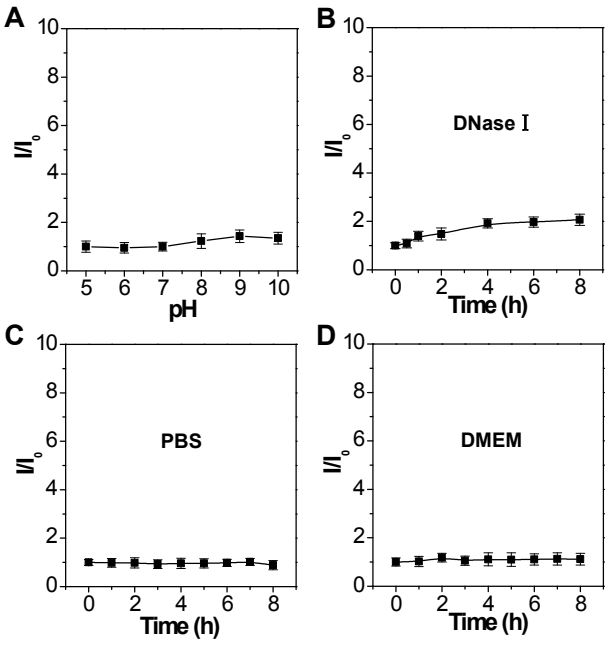

Fig. S7. Sticky-flares probe stability characterization against environmental factors. (A) Sticky-flares probe stability in different pH. Fluorescent enhancement factor plotted against pH fluctuations. Sticky-flares probe stability in the presence of (B) DNase I (C) PBS and (D) DMEM. Fluorescent enhancement factor plotted against time. The error bars represent standard deviation (± SD) from three independent tests.

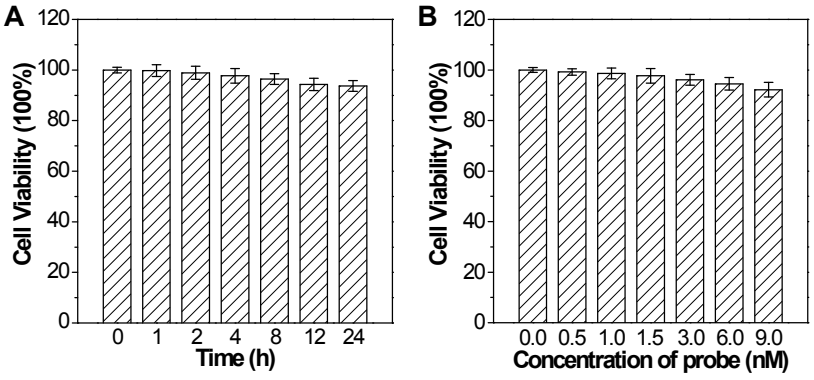

Fig. S8. Viability of KB cells in the presence of the sticky-flares probe measured with the MTT assay. (A) Cell viability plotted against time (0, 1, 2, 4, 8, 12 and 24 h). (B) Cell viability plotted against time (0, 0.5, 1.0, 1.5, 3.0, 6.0 and 9.0 nM). The error bars represent standard deviation (± SD) from three independent tests.

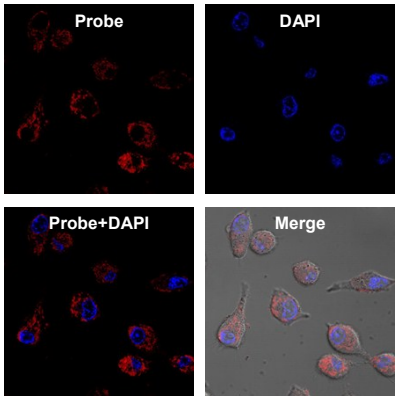

Fig. S9. Confocal images of KB cells incubated with 1.5 nM of sticky-flares for 4 h and 1μL of DAPI staining solution for 15 min.

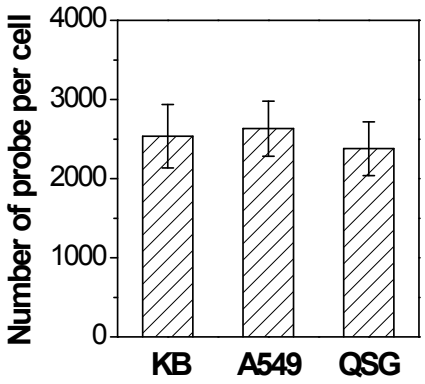

Fig. S10. Cellular uptake of sticky-flares probe in different type of cell lines incubated with 1.5 nM sticky-flares probe for 24 h. The error bars represent standard deviation (± SD) from three independent tests.

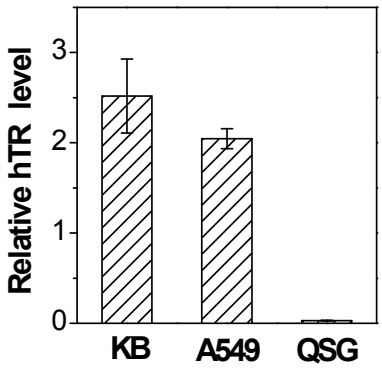

Fig. S11. Relative hTR expression level in different type of cell lines. The error bars represent standard deviation (± SD) from three independent tests.