

## *Electronic Supplementary Information (ESI)*

### **Telomerase Activity Detection in Cancer Cell via Primer Extension- Mediated Fluorescence Enhancement of Silver Nanoclusters**

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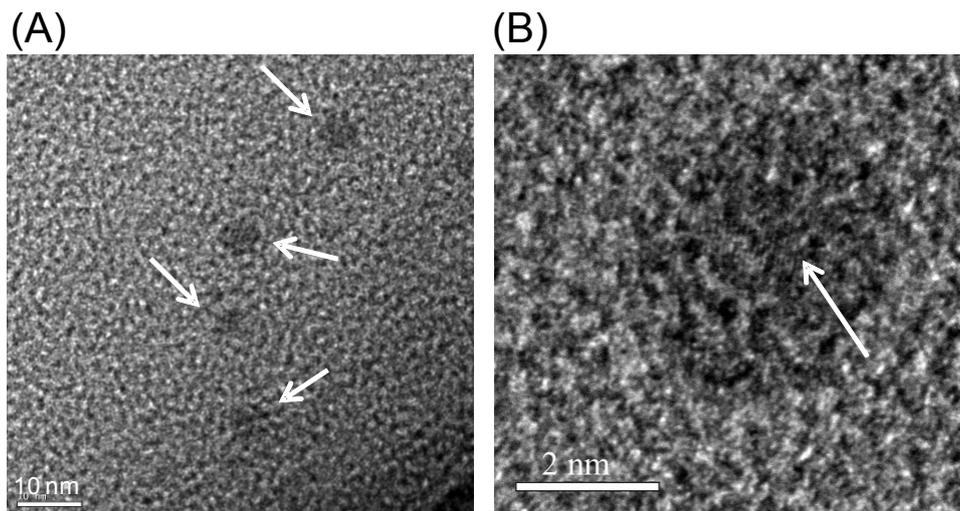
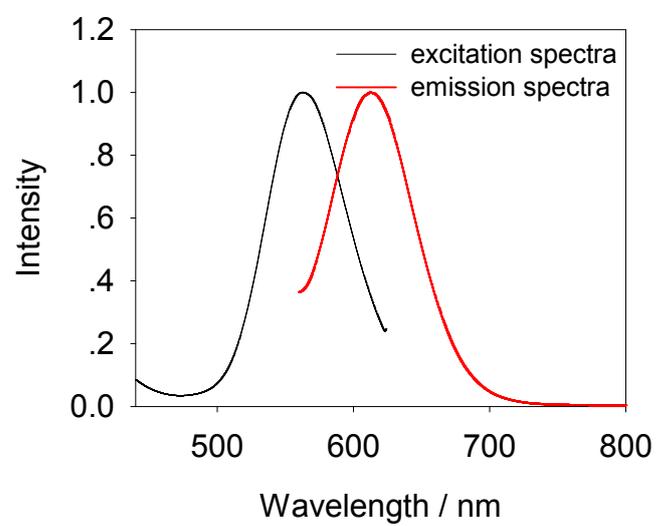
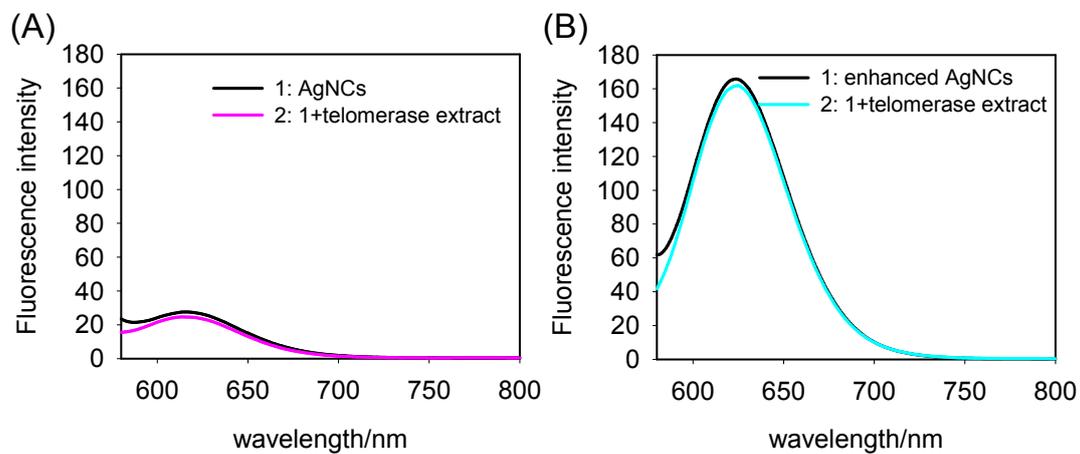


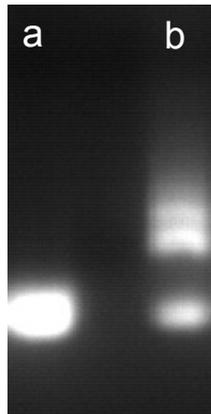
Fig. S1 (A) TEM images of AgNCs; (B) High-resolution TEM image of the crystal lattice (arrow) structure of the AgNCs formed.



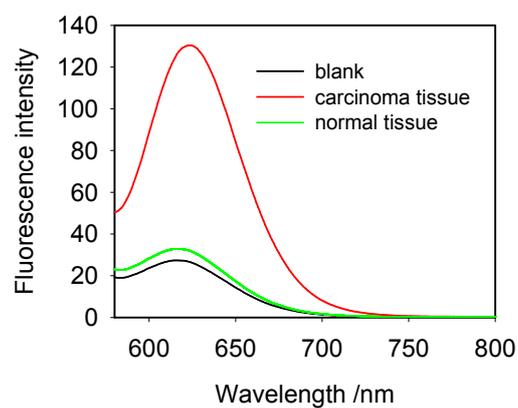
**Fig. S2** The excitation and emission spectra of AgNCs.



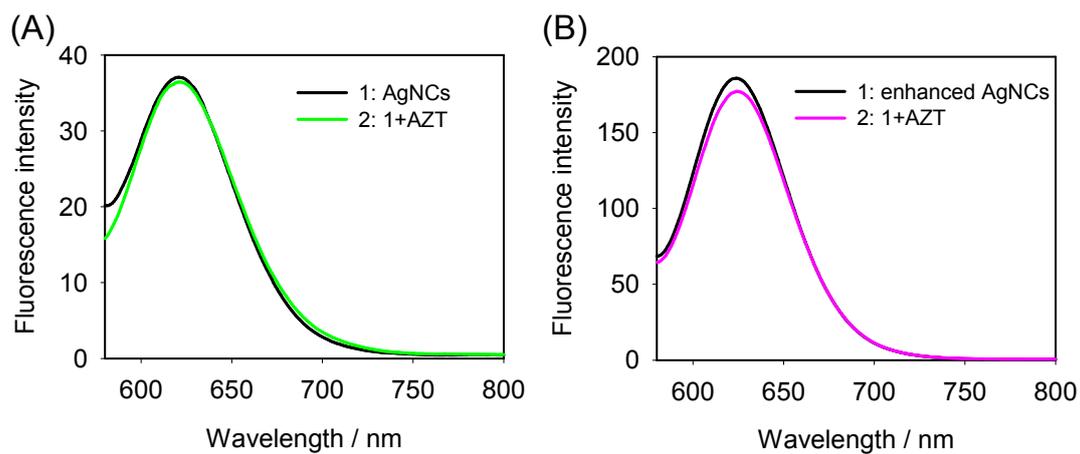
**Fig. S3** The effect of cell extracts on the fluorescence properties of AgNCs. No obvious effect on the fluorescence of AgNCs itself was observed from the un-inactivated cell extracts (A), and negligible effect on the fluorescence of AgNCs enhanced by G-rich DNA in proximity was observed from the un-inactivated cell extracts (B).



**Fig. S4** Direct characterization of the telomerase-catalyzed extension products by electrophoresis. a, the primer; b, the extension products.



**Fig. S5** The feasibility of the presented method for the real tissue samples. A tumor was first implanted in a nude mice, telomerase was respectively extracted from carcinoma tissue or normal tissue. Stronger fluorescence signal was detected for telomerase extracts of carcinoma tissue than normal tissue, indicating good feasibility of the presented method for the real samples.



**Fig. S6** The effect of AZT itself on the fluorescence properties of AgNCs. No obvious effect on the fluorescence of AgNCs itself was observed from the AZT (A), and slight quenching effect on the fluorescence of AgNCs enhanced by G-rich DNA in proximity was observed from AZT (B).

**Table S1** Comparison of Our Proposed Method with Reported Telomerase Detection Methods.

method	system	detection limit	detection time	reference
optical	HRP-mimic DNAzyme catalytic beacons	500 cells	1.5	<i>J. Am. Chem. Soc.</i> 2004, 126, 7430–7431.
optical	CdSe/ZnS QDs/telomerase primer/Texas red-dUTP	1000 cells	3.5	<i>Analyst</i> 2008, 133, 1593–1598
optical	CdSe/ZnS QDs/telomerase primer/hemin	269 cells/ $\mu$ L	3.5	<i>Anal. Chem.</i> 2010, 82, 8390–8397
optical	telomerase primer-modified Au electrode/DNAzyme-functionalized Au NPs	1000 cells	2 day	<i>Nano Lett.</i> 2004, 4, 1683–1687
optical	cantilevers/magnetic nanoparticles	100 cells	3 h	<i>Cancer Res.</i> 2004, 64, 639–643.
optical	ZnP/telomerase/G-quadruplex	380 cells/ $\mu$ L	3.5 h	<i>Anal. Chem.</i> 2012, 84, 4789–4797
electrochemical	telomerase primer-modified electrode	67 cells/ $\mu$ L	3.5 h	<i>Anal. Chem.</i> 2010, 82, 8390–8397.
electrochemical	telomerase primer-modified Au electrode- $\text{Fe}(\text{CN})_6^{3-}/\text{Fe}(\text{CN})_6^{4-}$	1000 cells	1 day	<i>Chem. Commun.</i> 2011, 47, 3129–3131.
optical	AgNCs enhanced by the extended products catalyzed by telomerase	62 cells	~2 h	present study