Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B.

AuNPs-capped cage fluorescent biosensor based on controlled-release and cyclic enzymatic amplification for ultrasensitive detection of ATP

Wei Wang,* Xin Li, Kai Tang, Zhiling Song, and Xiliang Luo*

Key Laboratory of Optic-electric Sensing and Analytical Chemistry for Life Science, Ministry of Education, Shandong Key Laboratory of Biochemical Analysis, Key Laboratory of Analytical Chemistry for Life Science in Universities of Shandong, College of Chemistry and Molecular Engineering, Qingdao University of Science and Technology, Qingdao, 266042, P. R. China

Characterization of the synthesized AuNCs

UV-visible-near-IR absorbance spectrum of AuNCs (**Figure. S1**) is proved here to exhibit its surface plasmon resonance peak.

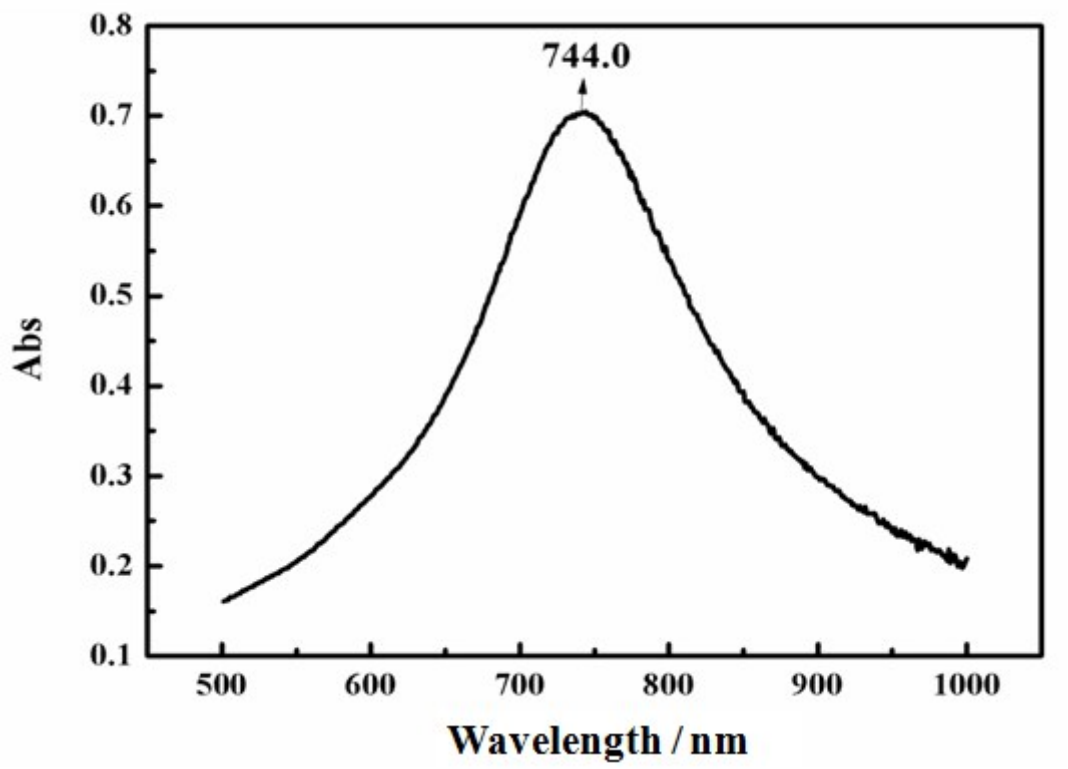

Figure. S1 UV-visible-near-IR absorbance spectrum of AuNCs.

Characterization of the synthesized AuNPs

UV-visible-near-IR absorbance spectrum of AuNPs (**Figure. S2**) is proved here to exhibit its absorption peak.

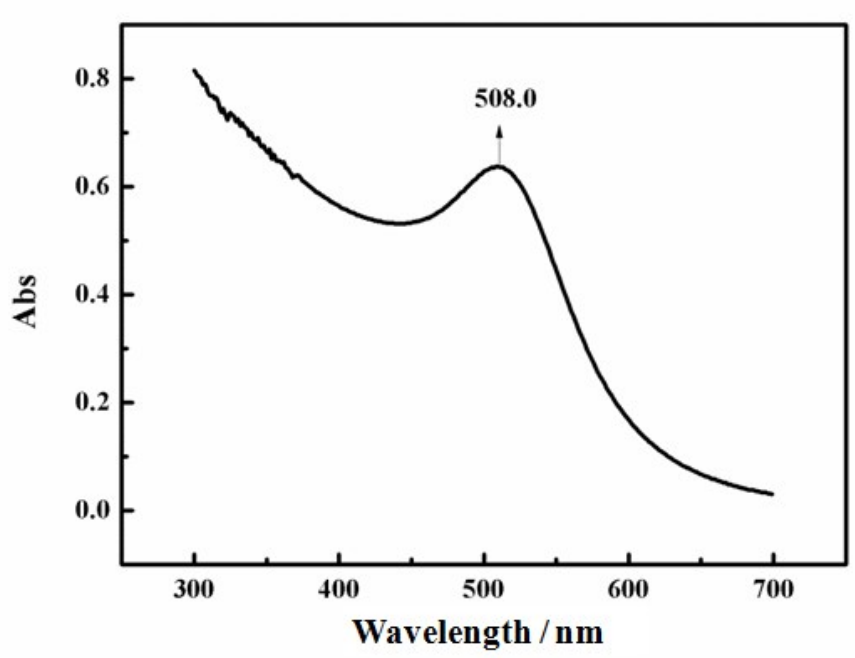

Figure. S2 UV-visible-near-IR absorbance spectrum of AuNPs.

TEM image of the synthesized AuNPs-capped AuNCs.

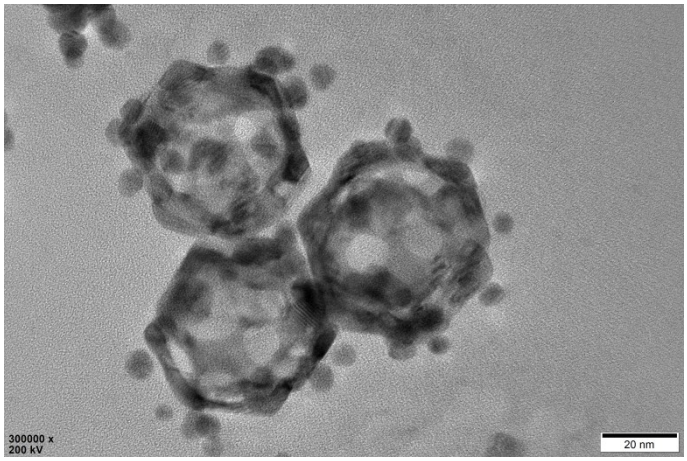

Figure. S3 TEM image of the synthesized AuNPs-capped AuNCs.

Optimization of the incubation temperature

Figure. S4 showed the different fluorescence signals of the sensing system in the presence of the 1.0×10^{-7} M ATP at different temperature.

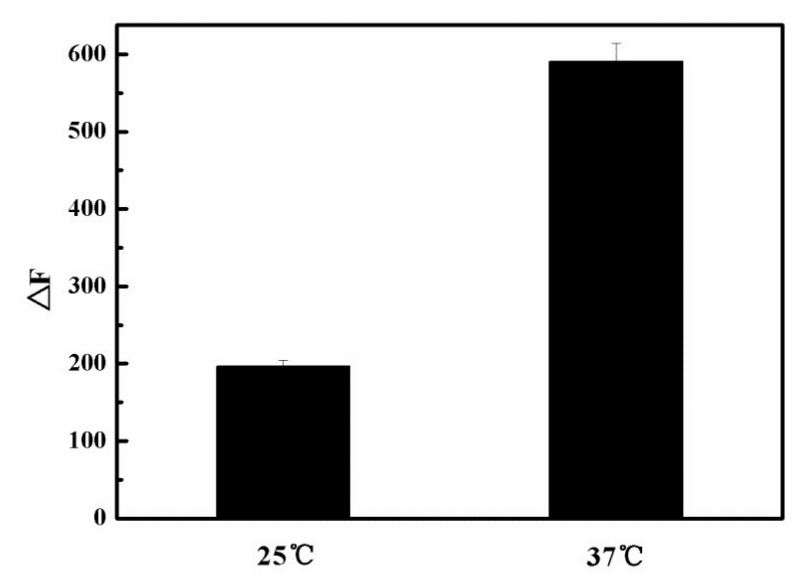

Figure. S4 The different fluorescence signals between ExoⅢ reaction with the corresponding blank at different temperature.

Optimization of the reaction time

Figure. S5 showed the relationship between the reaction time and the fluorescence of the RhB in the presence of the 1.0×10^{-7} M ATP.

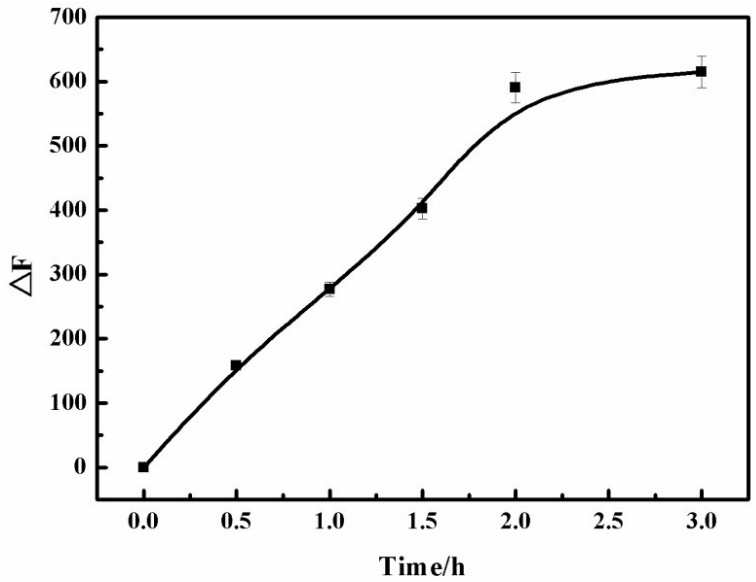

Figure. S5 The relationship between the reaction time and the fluorescence of the RhB in the presence of the 1.0×10^{-7} M ATP.

Preliminary analysis of the biosensor in tumor cells

Fig S6 showed the fluorescence intensity of RhB from the hollow interiors of AuNCs toward Hela cell lysate (curve a) and PBS (curve b).

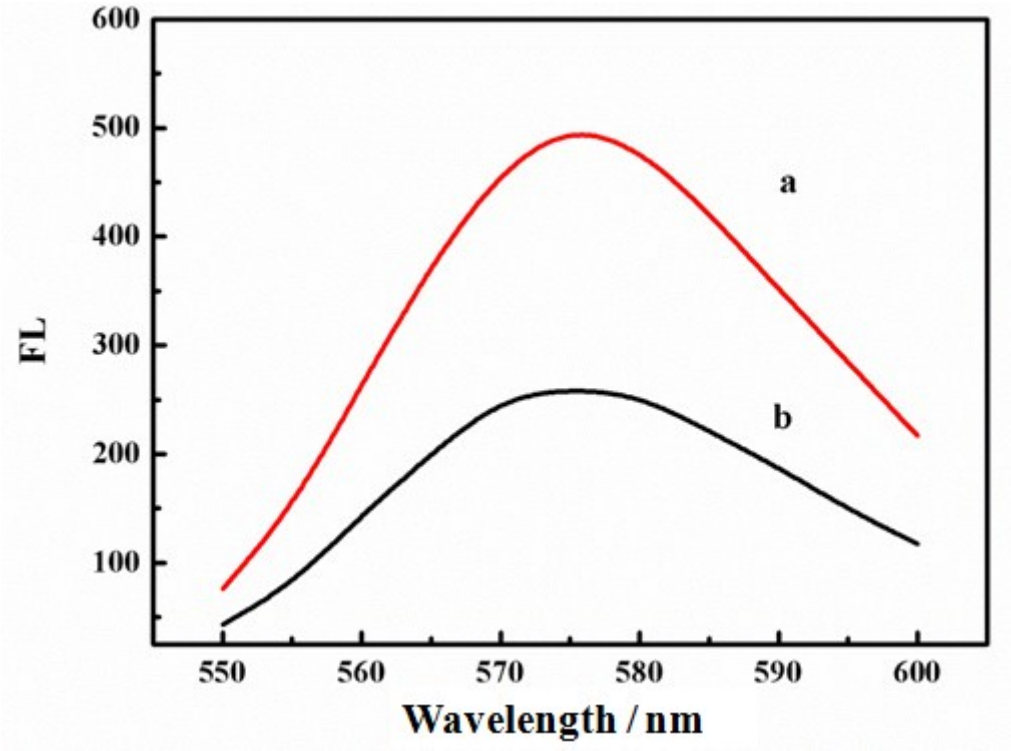

Fig. S6 The fluorescent signal of RhB released from the hollow interiors of AuNCs toward Hela cells lysate (a) and PBS (b).

Table. S1 Comparison of different methods for assay of ATP.

Methods	Detection Limit	Linear Range	Refs
Ratiometric biosensor	1.3 μM	0 – 150 μM	[1]
Fluorescent sensor	42.3 nM	0 – 20 μM	[2]
GSH-AuNCs complex	1 μM	0 – 100 μM	[3]
Fluorescent probe	5 μM	0 – 140 μM	[4]
DNAzyme amplification	150 nM	2 – 90 μM	[5]
G-quadruplex sensor	3.5 μM	10 – 50 μM	[6]
Ratiometric sensor	65 nM	0.1 – 10 μM	[7]
GO-allosteric aptasensor	31 nM	50 – 500 nM	[8]
Fluorescent biosensor	0.88 nM	1 – 100 nM	This work

References

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