Electronic Supplementary Material (ESI) for Analyst.
This journal is © The Royal Society of Chemistry 2015

Electronic Supplementary Information

Isothermal Amplified Detection of ATP Using Au Nanocages Capped with DNA Molecular Gate and Its Application in Cell Lysates

Wei Wang,* Na Zhao, Xiaoxiao Li, Jun Wan and Xiliang Luo*

Key Laboratory of Sensor Analysis of Tumor Marker, Ministry of Education, College of Chemistry and Molecular Engineering, Qingdao University of Science and Technology, Qingdao 266042, China.

Synthesis of AuNCs

UV-visible-near-IR absorbance spectrum of AuNCs (Figure S1) is provided here to show its surface plasmon resonance peak of the AuNCs.

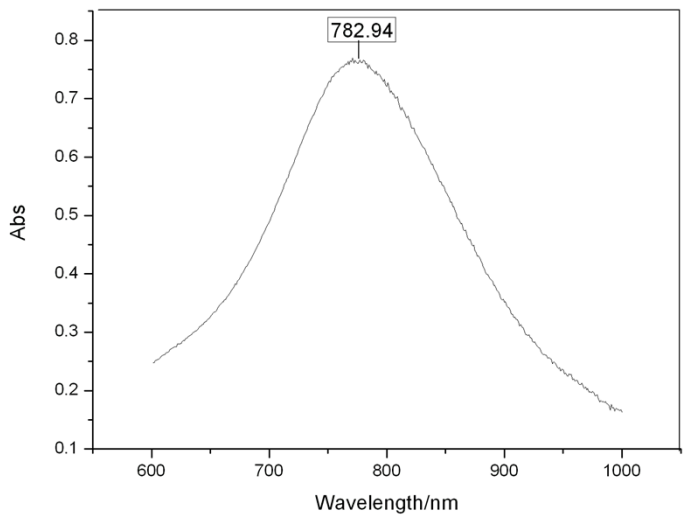

Figure S1. UV-visible-near-IR absorbance spectrum of AuNCs.

Fabrication of the DNAs-Based Controlled-Relase Biosensor

Figure S2 shows the fluorescent signals of RhB released from the hollow interiors of AuNCs. Curve b shows the fluorescent signal of released RhB without ATP. As indicated in Figure S2, significantly enhanced fluorescent signal was indeed observed in the presence of ATP (curve a).

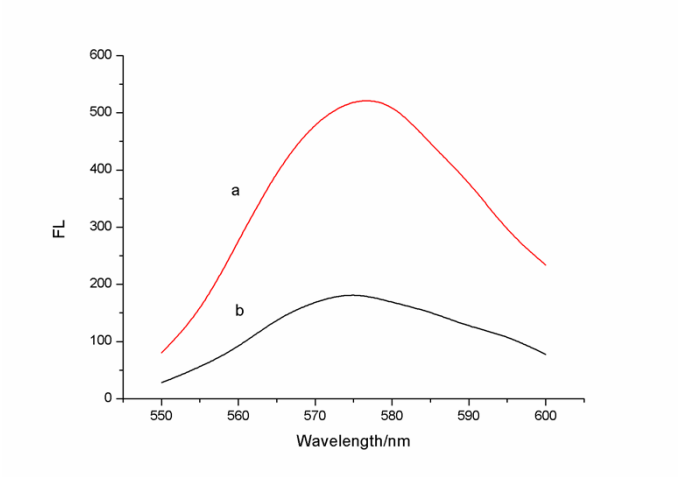

Figure S2. Fluorescent signal of the solution in the absence (b) and in the presence of 5.0×10^{-7} M of ATP (a).

Optimization of the incubation time

Figure S3 showed the relationship between the incubation time and the fluorescence signal in the presence of 10.0 μM ATP with the proposed biosensor.

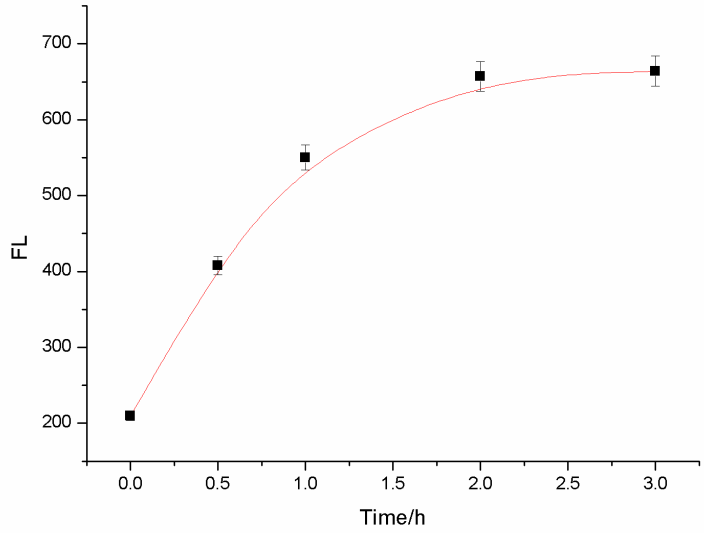

Figure S3. Effect of the incubation time for the cyclic enzymatic signal amplification process. Data are means ± SD of three independent experiments.

Detection of ATP by the Controlled-Release Biosensor

Figure S4 shows the fluorescence intensity of RhB released from the hollow interiors of AuNCs toward different concentrations of ATP (0, 5.0×10^{-8}, 1.0×10^{-7}, 2.0×10^{-7}, 5.0×10^{-7}, 8.0×10^{-7}, 1.0×10^{-6}, 5.0×10^{-6}, 1.0×10^{-5} M).

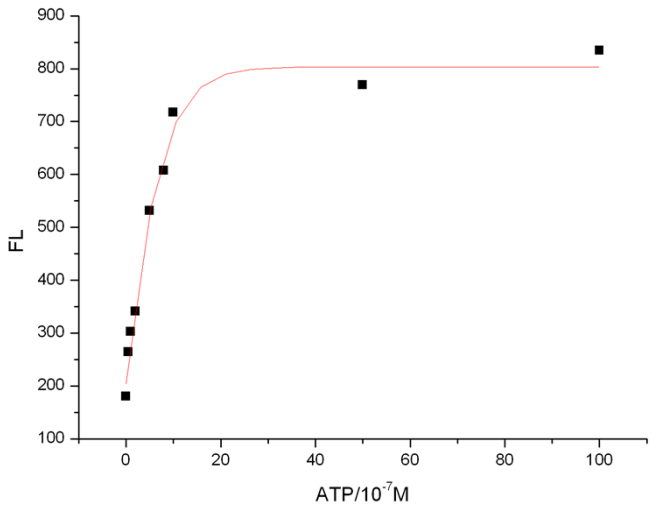

Figure S4. The fluorescence intensity toward different concentrations of ATP (0, 5.0×10^{-8}, 1.0×10^{-7}, 2.0×10^{-7}, 5.0×10^{-7}, 8.0×10^{-7}, 1.0×10^{-6}, 5.0×10^{-6}, 1.0×10^{-5} M).

Determination of ATP in a Cultured Cell Extract

Figure S5 shows the fluorescence intensity of RhB released from the hollow interiors of AuNCs toward the Ramos cell lysate (a) and PBS (b).

Figure S5. The fluorescent signal of GhB released from the hollow interiors of AuNCs toward Ramos cell lysate (a) and PBS (b).