Supporting Information

A highly selective and sensitive fluorescence probe for lactate dehydrogenase based on the ultrabright adenosine monophosphate capped gold nanoclusters

Jiao Liu, Hong-Wei Li,* Yuqing Wu*

State Key Laboratory of Supramolecular Structure and Materials, Institute of Theoretical Chemistry, Jilin University, No. 2699 Qianjin Street, Changchun 130012, China.

E-mail: lihongwei@jlu.edu.cn; yqwu@jlu.edu.cn.

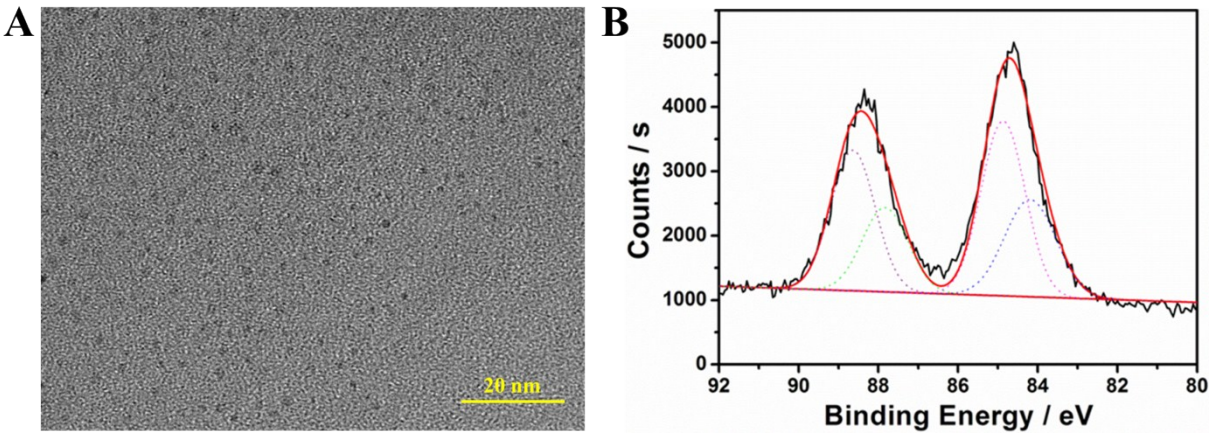

Fig. S1 (A) Typical TEM image and (B) Au 4f XPS spectra of AuNCs@AMP.

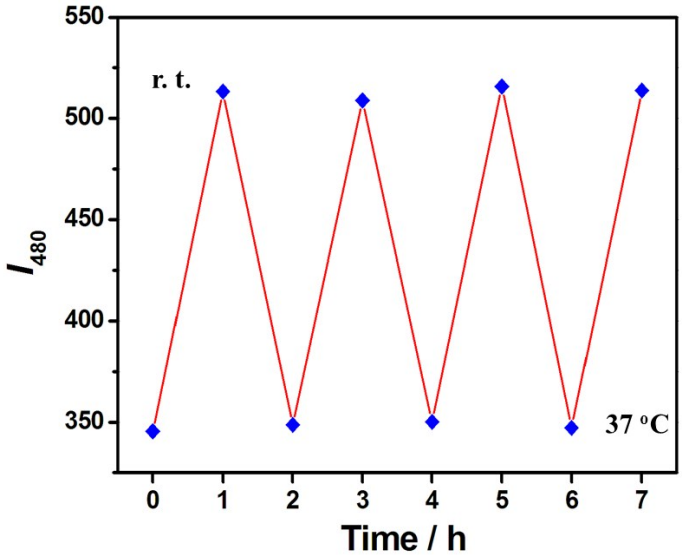

Fig. S2 The fluorescence stability of AuNCs@AMP (3.0 mg/L) in PBS (20 mM, pH = 7.4), being incubated at 37 °C and room temperature (r. t.), respectively, for several circulatory.

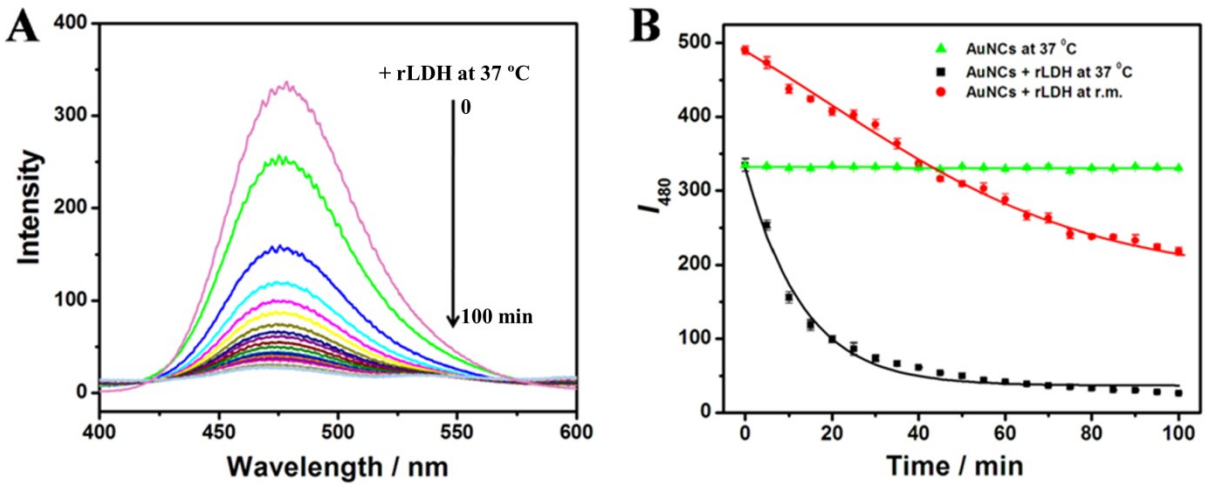

Fig. S3 A) The time-course fluorescence spectra of AuNCs@AMP (3.0 mg/L) in the absence and presence of rLDH (2.0 μM) in PBS (20 mM, pH = 7.4) at 37 °C; B) The corresponding fluorescence intensity (480 nm) changes at 37 °C and room temperature (r. t.), respectively, as well as the control experiment of AuNCs@AMP without rLDH (λ_{ex} = 328 nm).

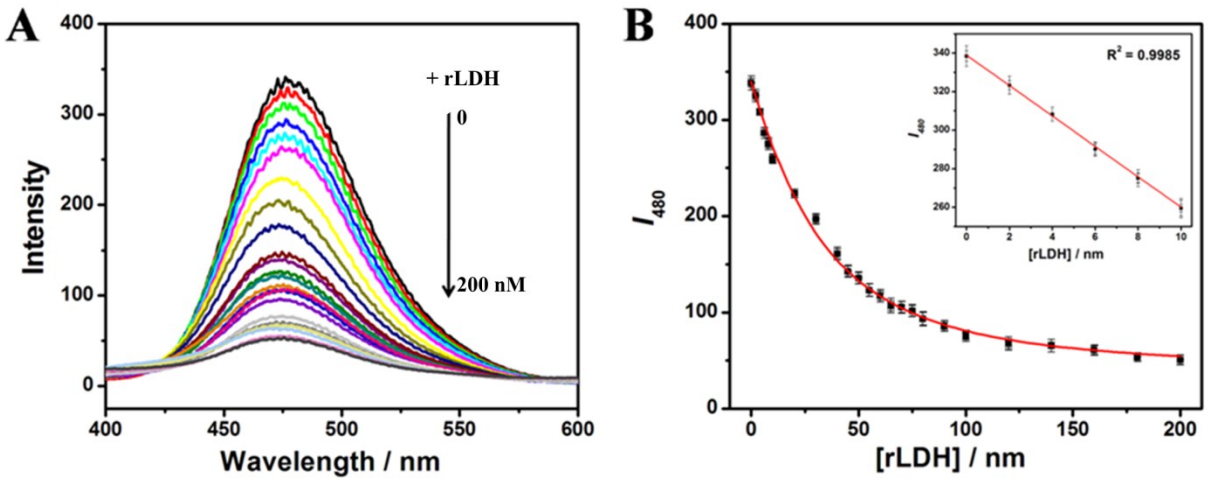

Fig. S4 A) The fluorescence spectra of AuNCs@AMP (0.30 mg/L) in PBS (20 mM, pH = 7.4) in the absence and presence of different amount of rLDH (5.0–200 nM); B) the corresponding fluorescence intensity of AuNCs@AMP *vs* the concentration of rLDH; inset is the enlargement for the range of 0−10 nM.

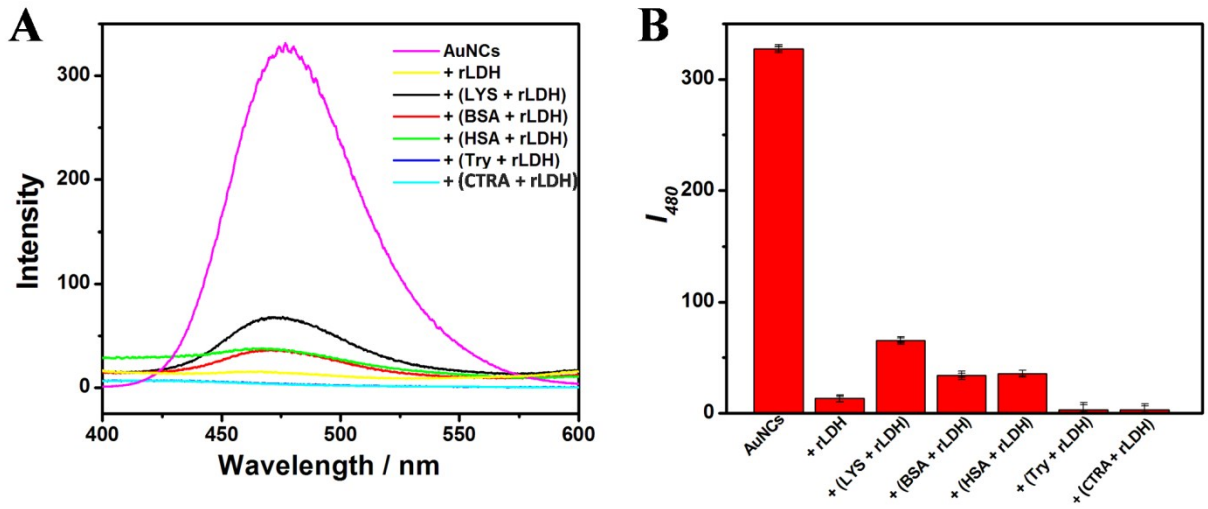

Fig. S5 A) The fluorescence spectra of AuNCs@AMP (3.0 mg/L) in the absence and presence of rLDH (2.0 μM) together with the indicated proteins (2.0 μM) in PBS (20 mM, pH = 7.4); B) The corresponding fluorescence intensity of AuNCs@AMP at 480 nm in the absence and presence of proteins.

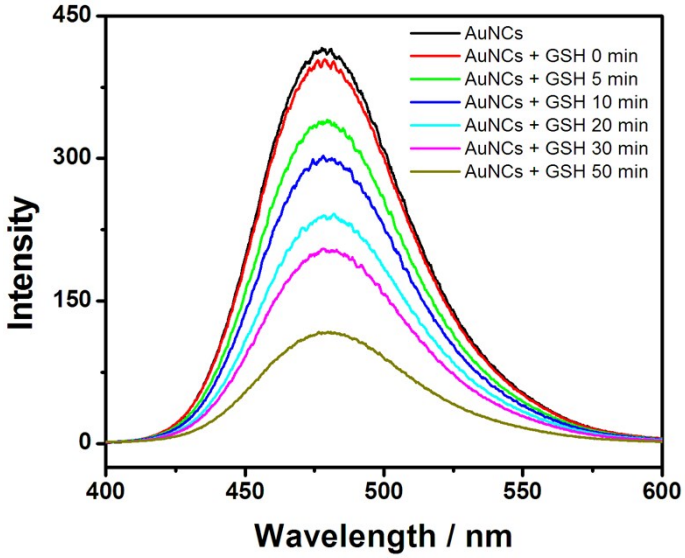

Fig. S6 The time-course fluorescence spectra of AuNCs@AMP (3.0 mg/L) in the absence and presence of GSH (10.0 μM) in PBS (20 mM, pH = 7.4; λ_{ex} = 328 nm).

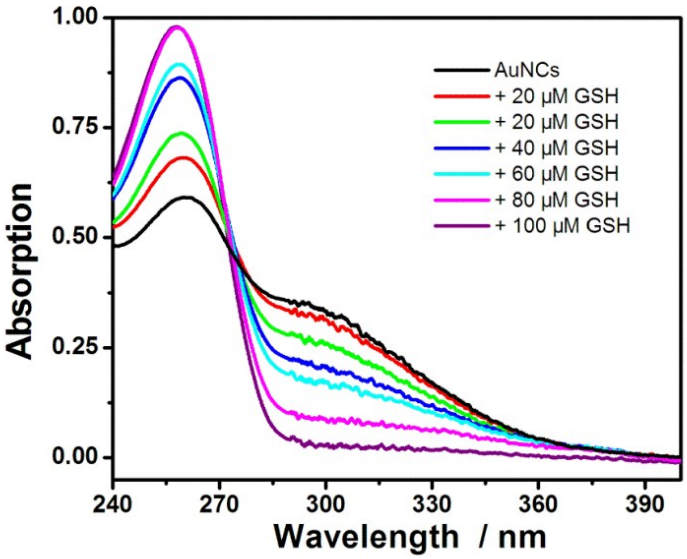

Fig. S7 The Uv-vis absorption spectra of AuNCs@AMP (30 mg/L) in the absence and presence of different amount of GSH in PBS (20 mM, pH = 7.4).

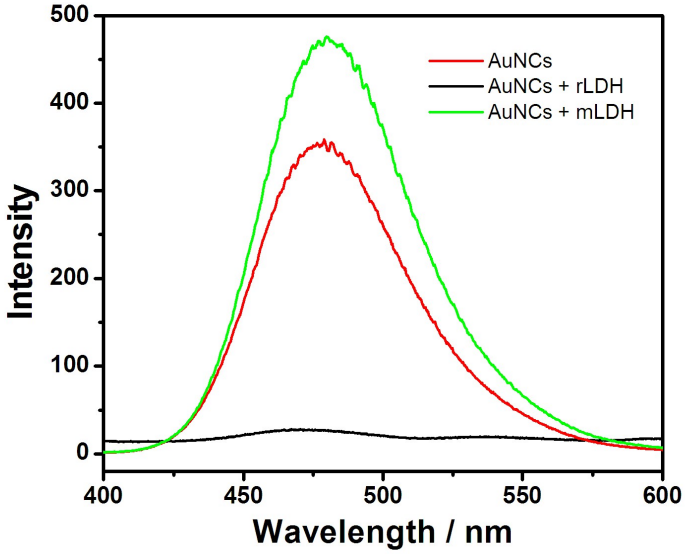

Fig. S8 The fluorescence spectra of AuNCs@AMP (3.0 mg/L) in the absence and presence of rLDH or the modified rLDH (mLDH, 2.0 μM) in PBS (20 mM, pH = 7.4; λ_{ex} = 328 nm). The modified rLDH was prepared by mixing 20 equiv. 2-maleimidoacetic acid with rLDH for 60 min before use.

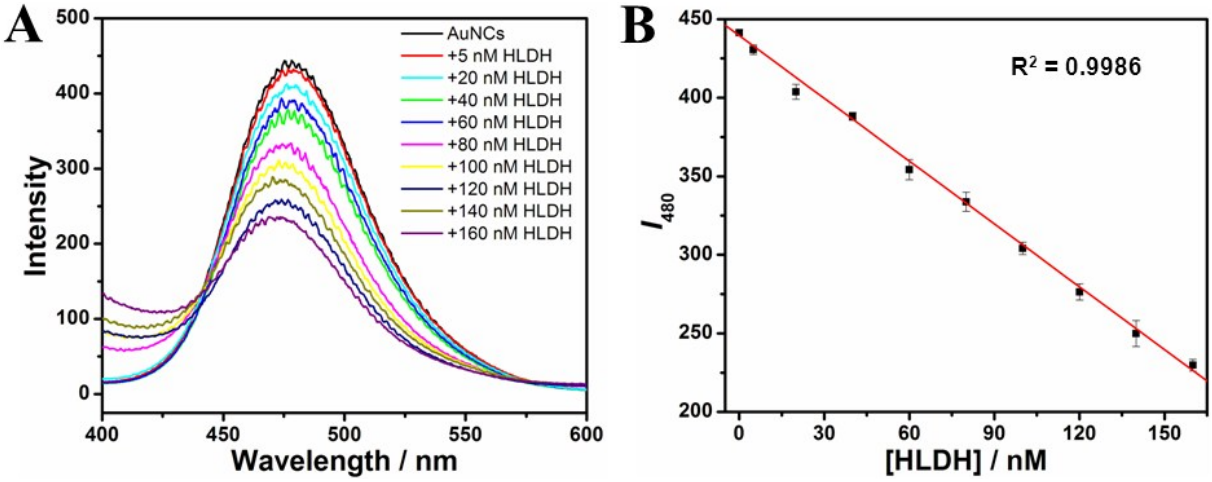

Fig. S9 A) The fluorescence spectra of AuNCs@AMP (3.0 mg/L) before and after adding different amount of HLDH (5.0–160 nM) in PBS (20 mM, pH = 7.4; λ_{ex} = 328 nm); B) The corresponding fluorescence intensity dependence of AuNCs@AMP on the concentrations of HLDH, which showed a linear response.

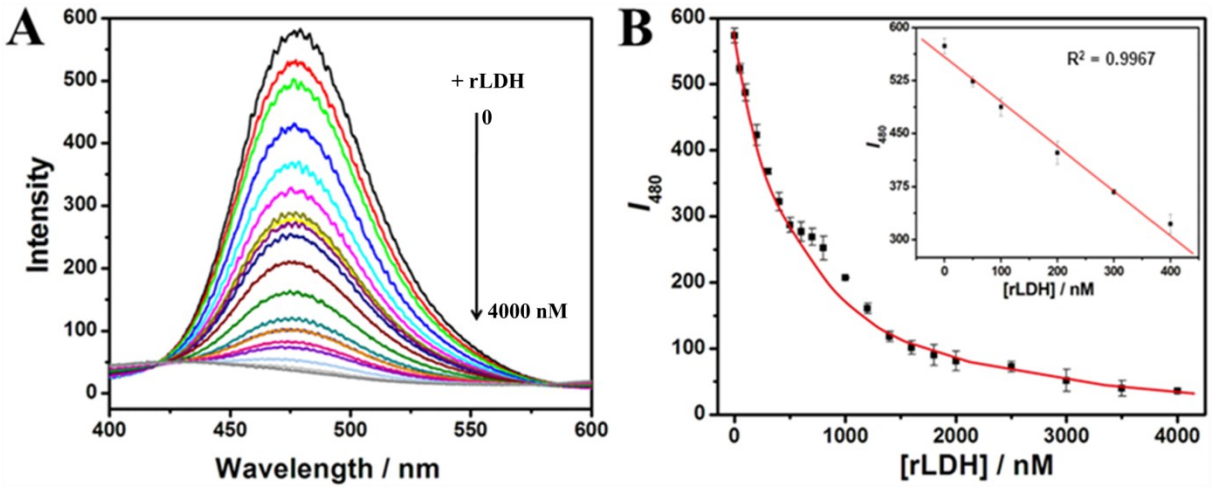

Fig. S10 A) The fluorescence spectra of AuNCs@AMP (3.0 mg/L) before and after adding different amount of rLDH (50–4000 nM) in the diluted fetal calf serum (1% in 20 mM PBS, pH = 7.4; λ_{ex} = 328 nm); B) The fluorescence intensity dependence of AuNCs@AMP on the concentrations of rLDH; inset is the enlargement for the range of 0−400 nM.

Table S1 Comparison of different materials for the determination of LDH.

Samples	Detection range	Detection limit	Ref.
Molecular beacon DNA molecule		40 U/L	21
Porous silicon microcavities	160–6500 U/L	80 U/L	22
Pyruvate + NADH	50–1200 U/L	31 U/L	23
CdTe/CdS QDs	150–1500 U/L	75 U/L	24
CdTe quantum dots	250–6000 U/L		25
CdSe quantum dots	200–2400 U/L		26
AuNCs@AMP	8.0–400 U/L	0.8 U/L	this work