Electronic Supplementary Information

Amino-functionalized Green Fluorescent Carbon Dots as Surface Energy Transfer Biosensors for Hyaluronidase

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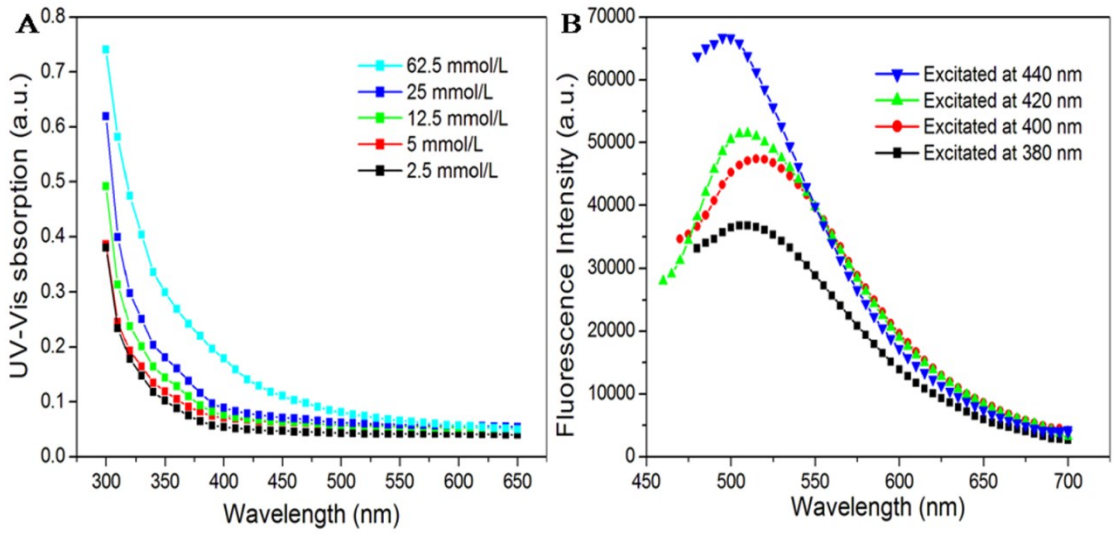

Fig. S1 (A) UV-Vis absorption spectra of CDs synthesized by different concentration of sodium pyrophosphate increasing from 2.5 to 62.5 mmol/L (2.5, 5, 12.5, 25, 62.5 mmol/L). (B) The fluorescence emission spectra of CDs with different fluorescence excitation wavelengths.

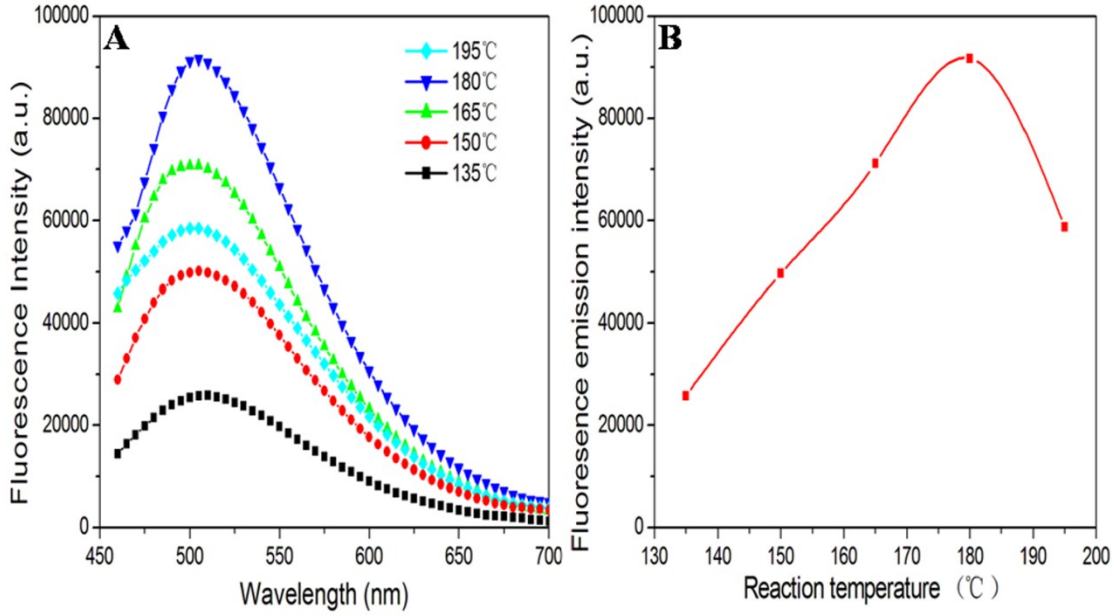

Fig. S2 (A) Fluorescence emission spectra and (B) fluorescence emission intensity at maximum of CDs synthesized at various temperature. (Sodium pyrophosphate concentration was 62.5 mmol/L)

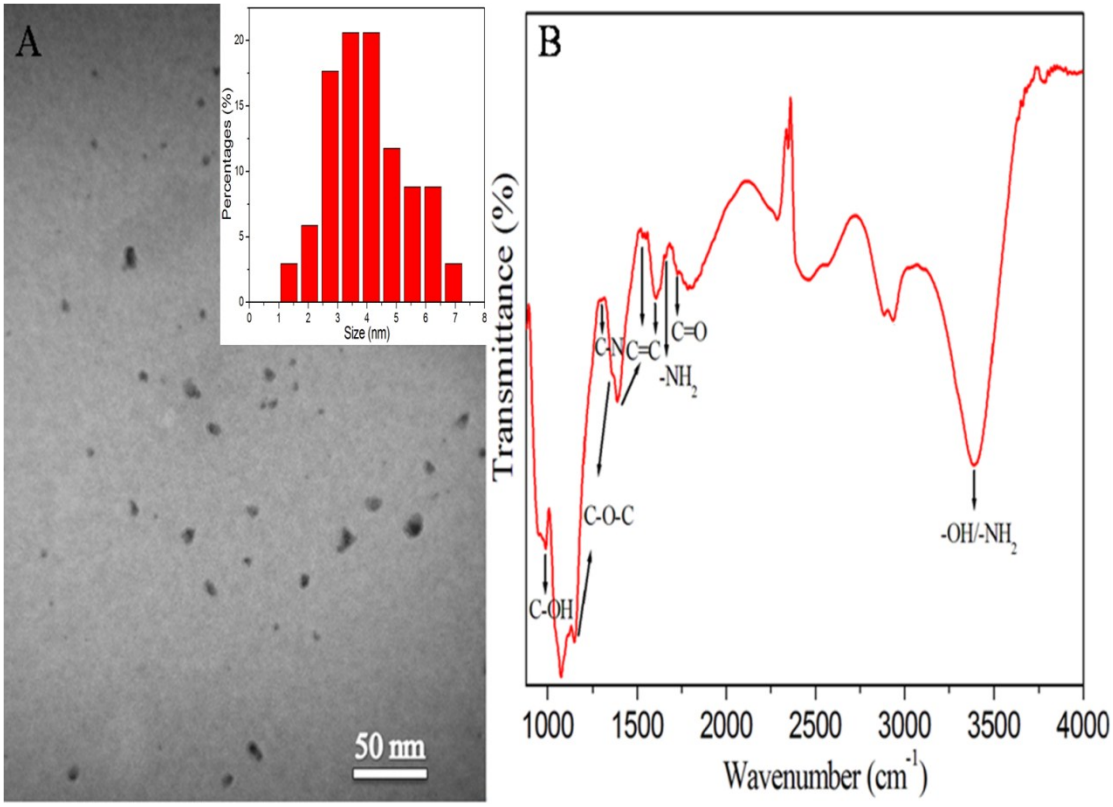

Fig.S3 (A) The TEM image and (B) FT-IR spectra of as-prepared CDs

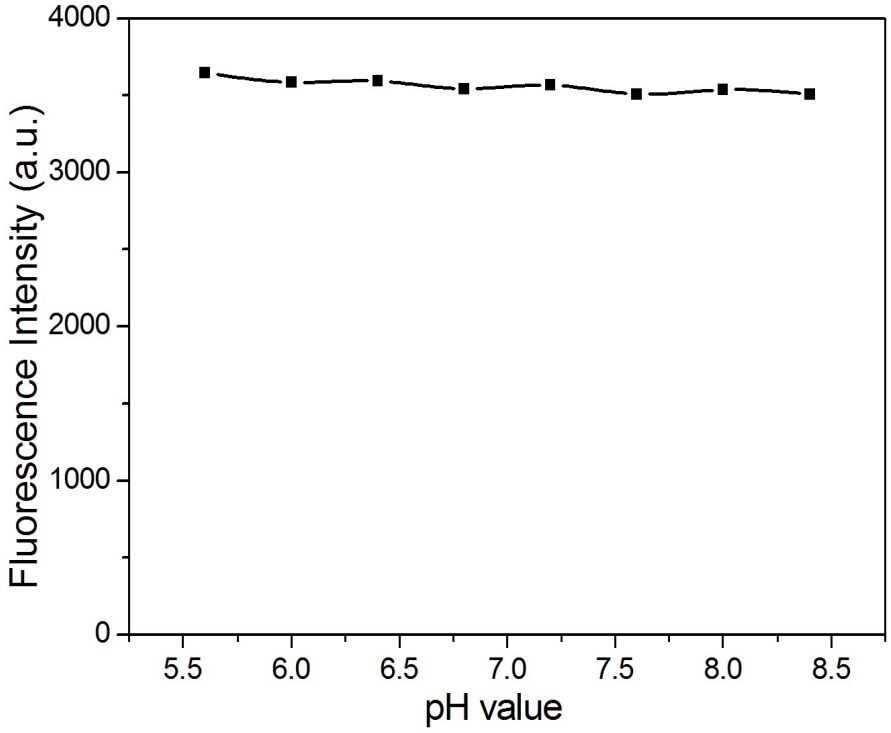

Fig. S4 The fluorescence intensity of the synthesized CDs solution measured in different pH environments.

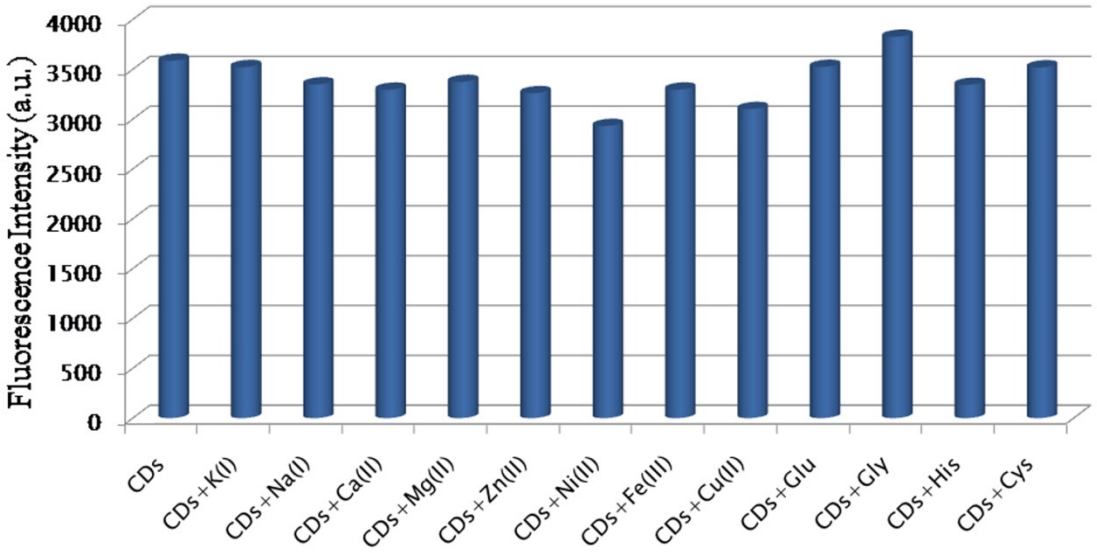

Fig.S5 The fluorescence intensity of CDs solution and CDs solution with individual metal ions and molecules. (5 mmol/L K^+, Na^+, Ca^{2+}, Mg^{2+}, Glu, Gly, His and Cys, 2.5 mmol/L Zn^{2+} and Ni^{2+}, and 0.2 mmol/L Fe^{3+} and Cu^{2+})

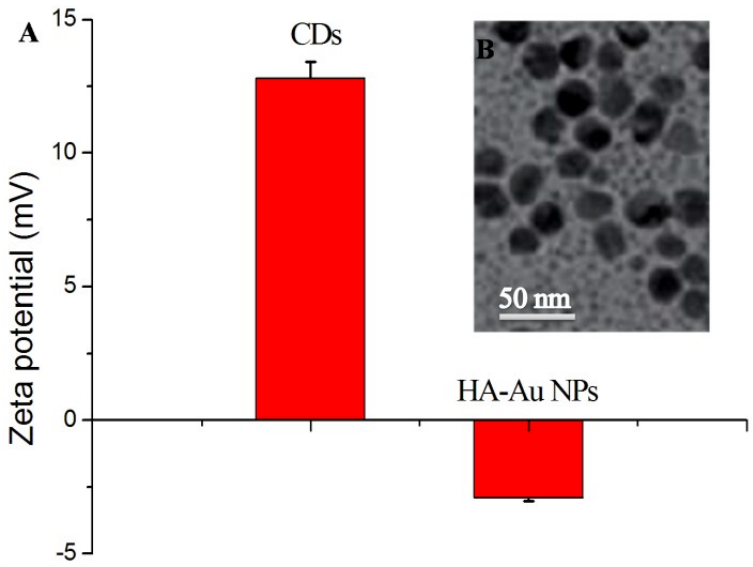

Fig.S6 (A) Zeta potentials measurements of amino-functionalized CDs and HA-AuNPs in pH 6.0 solution. (B) TEM image of amino-functionalized CDs and HA-Au NPs mixture solution.

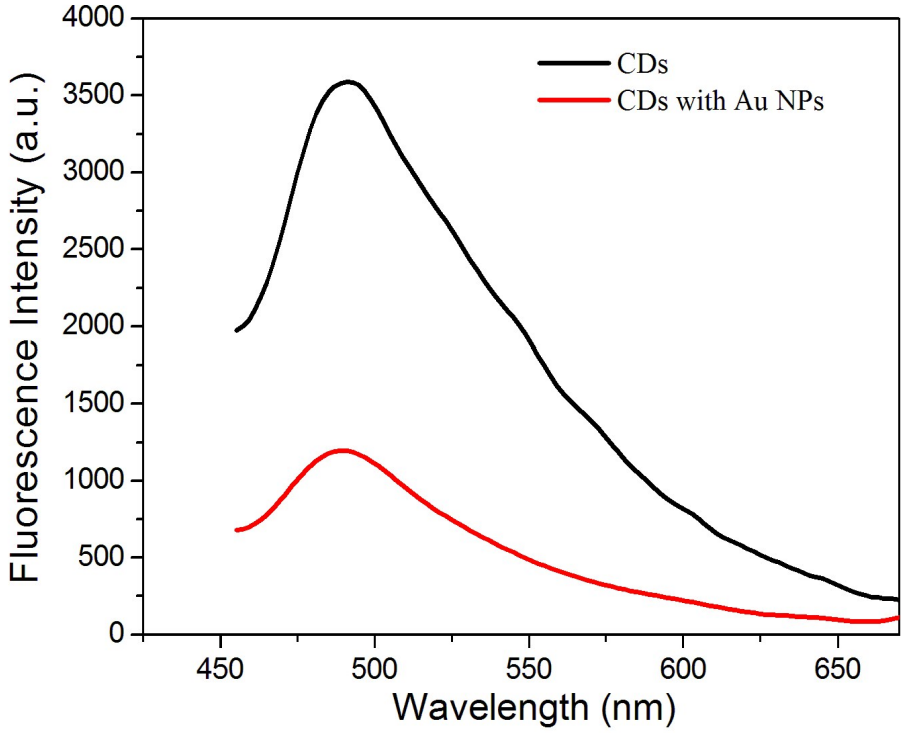

Fig.S7 The fluorescence emission spectra of prepared CDs solution with and without HA-Au NPs. (10 mmol/L NaH_2PO_4-Na_2HPO_4 buffer solution, pH 6.0)

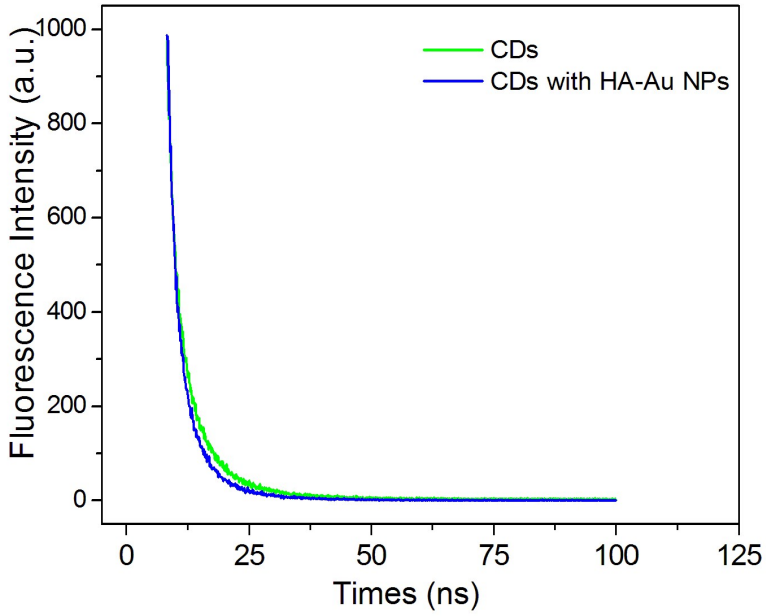

Fig.S8. The fluorescence life time determination of amino-functionalized CDs (Green line) and the SET system composed of amino-functionalized CDs and HA-Au NPs (Blue line).

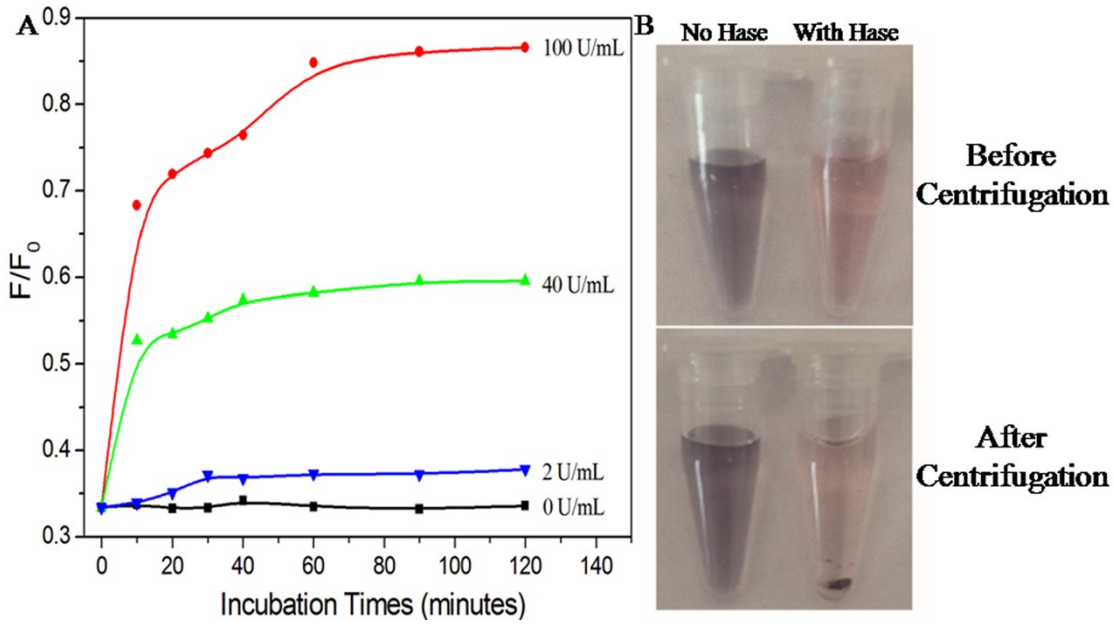

Fig.S9 (A) The fluorescence intensity ratios changes of CDs/HA-Au NPs system as a function of the Hase enzyme digestion time. The Hase concentration is respectively 0, 2, 40, 100 U/mL.

Reaction condition: 10 mmol/ L NaH_2PO_4-Na_2HPO_4 buffer solution (pH 6.0) at 37℃. F_0 is the original fluorescence intensity of CDs, and F is the fluorescence intensity of CDs/HA-Au NPs system with the addition of various concentration of Hase. (B) The picture shows the color change of the CDs/HA-Au NPs solutions incubated with 100 U/mL Hase before or after centrifugation.

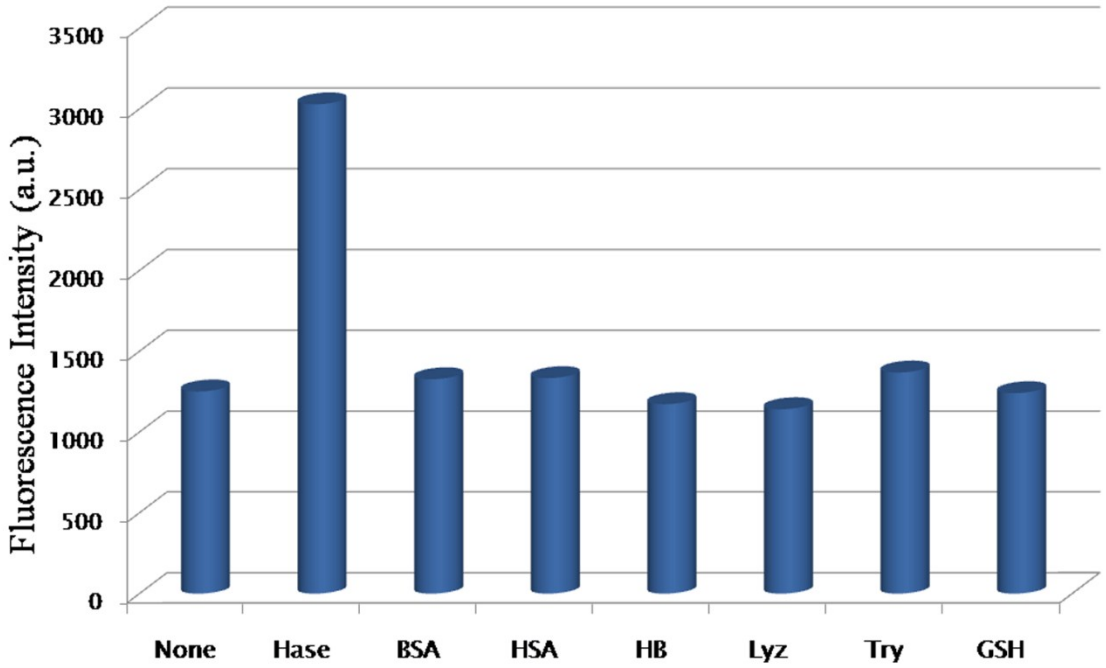

Fig.S10 The fluorescence intensity of the CDs/HA-Au NPs assay system and respectively incubated with 0.25 mg/mL (100 U/mL) Hase, BSA, HSA, HB, Lyz, Try or GSH for 2 hours. Reaction condition: 10 mmol/ L NaH_2PO_4-Na_2HPO_4 buffer solution (pH 6.0) at 37℃.

Table S1 Determination of Hase in fetal bovine serum samples according to equation (1)

Serum samples	Added Hase (U/mL)	Detected Hase (U/mL)	Recovery (%)	RSD (n=3, %)
1	0.50	0.54	108	4.7
2	5.0	5.1	102	3.2