One-pot Synthesis Polyamines Improved Magnetism and Fluorescence Fe_3O_4-Carbon Dots Hybrid NPs for Dual Modal Imaging

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S1. EXPERIMENTAL SECTION

S1.1 Preparation of TETA-CDs

0.105g CA was dissolved in H_2O and triethylenetetramine （TETA） 10 mL (volume ratio 9:1). The precursor solution was transferred to a 20 ml Teflon-lined stainless steel autoclave. After sealing, the autoclave was heated to and maintained at 200 °C for 6 h. The autoclave was then cooled naturally to room temperature. The obtained Yellow transparent solution was label as TETA-CDs solution.

S1.2 Preparation of CA-CDs

0.105g CA was dissolved in H_2O 10 ml. The precursor solution was transferred to a 20 ml Teflon-lined stainless steel autoclave. After sealing, the autoclave was heated to and maintained at 200 °C for 6 h. The autoclave was then cooled naturally to room temperature. The obtained transparent solution was label as CA-CDs solution.

S1.3 Preparation of N-CDs

0.105g CA and 0.09g Urea was dissolved in H_2O 10 ml. The precursor solution was transferred to a 20 ml Teflon-lined stainless steel autoclave. After sealing, the autoclave was heated to and maintained at 200 °C for 6 h. The autoclave was then cooled naturally to room temperature. The obtained Yellow transparent solution was label as N-CDs solution.

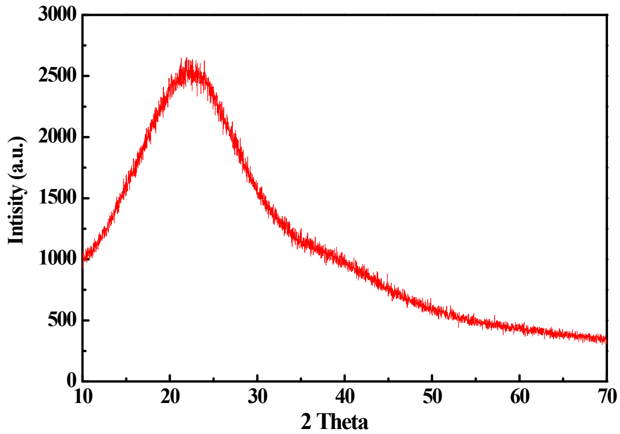


Figure S1. XRD patterns of TETA-CDs with hydrothermal time 6 h at 200 °C.

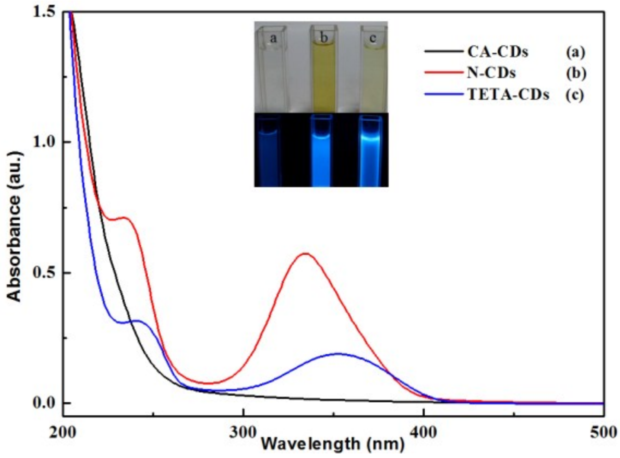


Figure S2. UV-vis absorption spectra of CA-CDs, N-CDs and TETA-CDs in water. The inset is the samples under day light and UV lamp (the excitation wavelength is 365 nm).

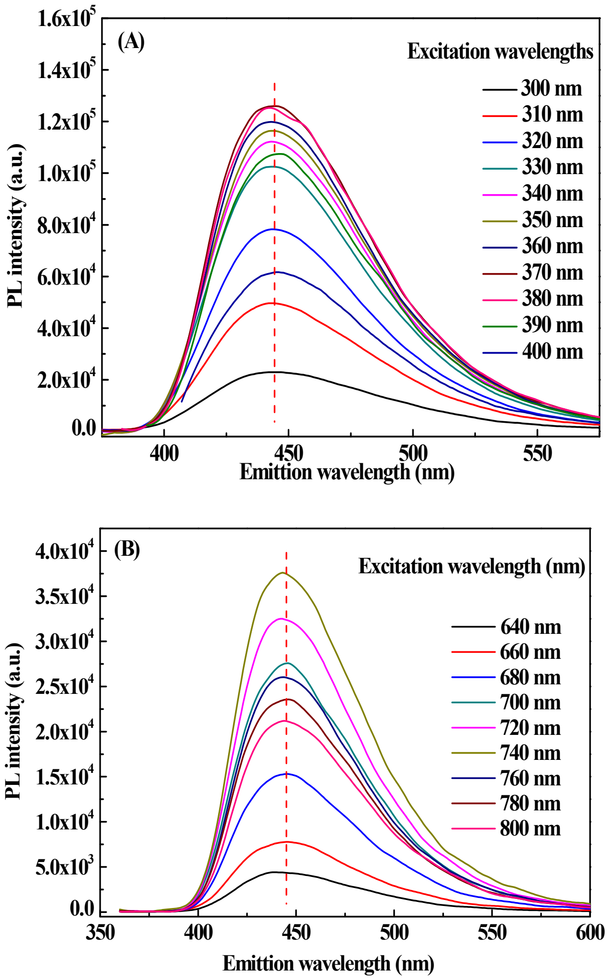


Figure S3 Fluorescence spectra of the TETA-CDs different excitation wavelengths: down-conversion (A) and up-conversion (B).

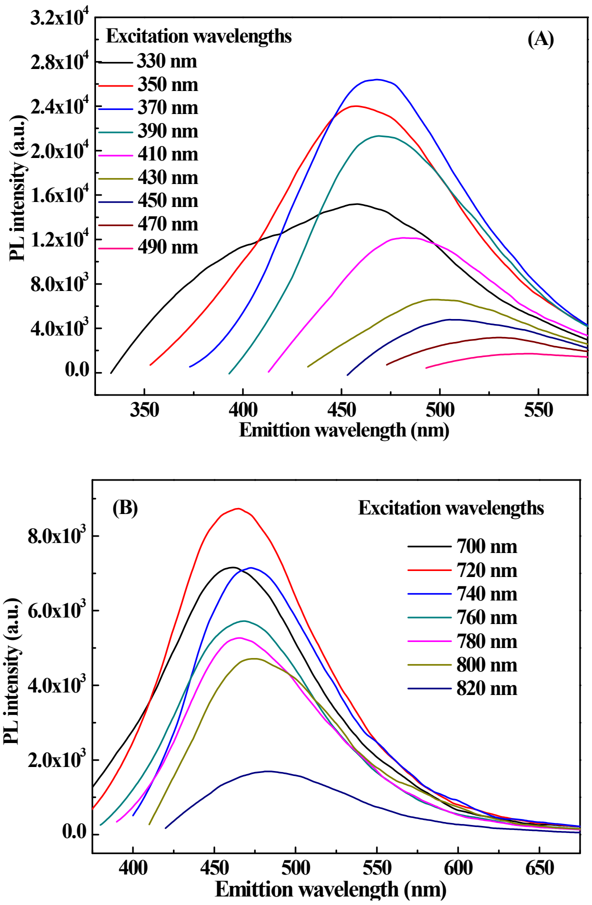
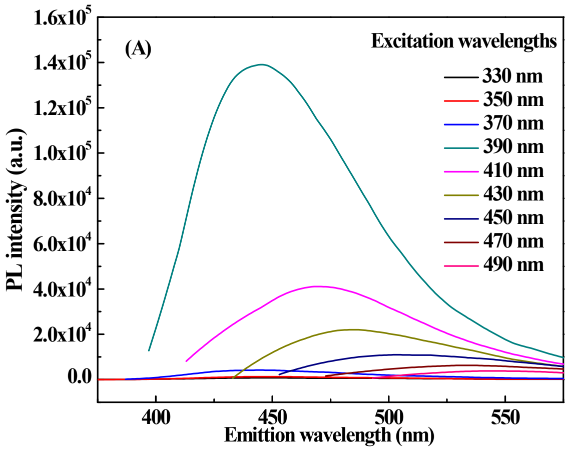


Figure S4 Fluorescence spectra of the CA-CDs different excitation wavelengths: down-conversion (A) and up-conversion (B).



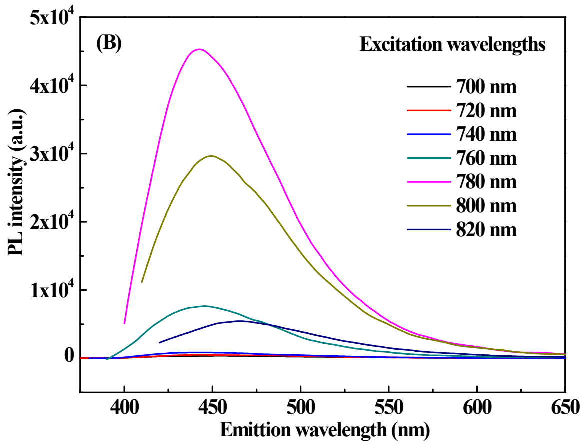


Figure S5 Fluorescence spectra of the N-CDs different excitation wavelengths: down-conversion (A) and up-conversion (B).

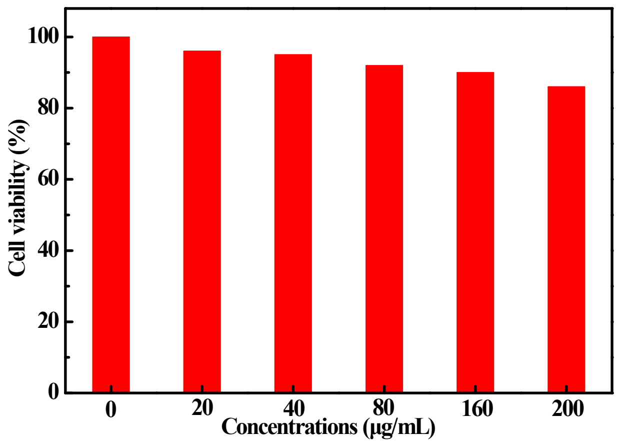


Figure S6. Effects of Fe_3O_4-CDs at varied concentrations on the viability of BHK cells.

Table S1 Photophysical Properties of TETA-CDs and Fe_3O_4-CDs. Decay times τ_1, τ_2 and τ_3, and the relative amplitude (%).

Compound	Monitored Emission Wavelength/nm	τ_1/ns	τ_2/ns	τ_3/ns
TETA-CDs	440	13.76(38.89%)	5.45(46.13%)	0.77(14.99%)
	460	13.78(40.21%)	5.37(45.74%)	0.69(14.05%)
	480	14.13(38.77%)	5.49(47.25%)	0.69(13.98%)
Fe_3O_4-CDs	440	12.84(34.14%)	5.31(65.86%)	
	460	13.04 (31.59%)	5.38(68.41%)	
	480	12.73 (30.96%)	5.42(69.04%)	