

Electronic Supporting Information

For

Gadolinium Functionalized Carbon Dots for Fluorescence/Magnetic
Resonance Dual-Modality Imaging of Mesenchymal Stem Cells

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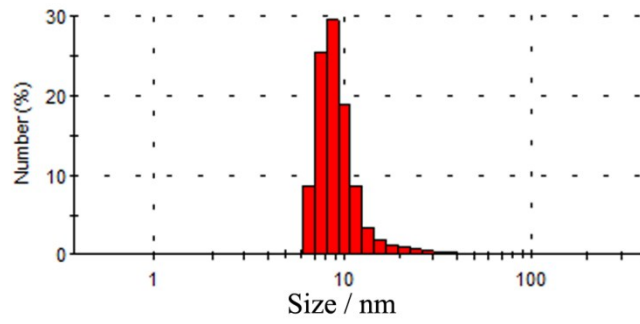


Figure S1. Size distribution of Gd-CDs in water determined by DLS (25°C, pH = 7).

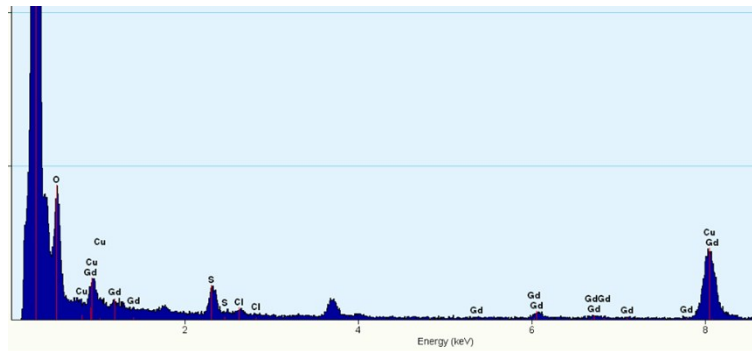


Figure S2. EDAX spectrum of Gd-CDs.

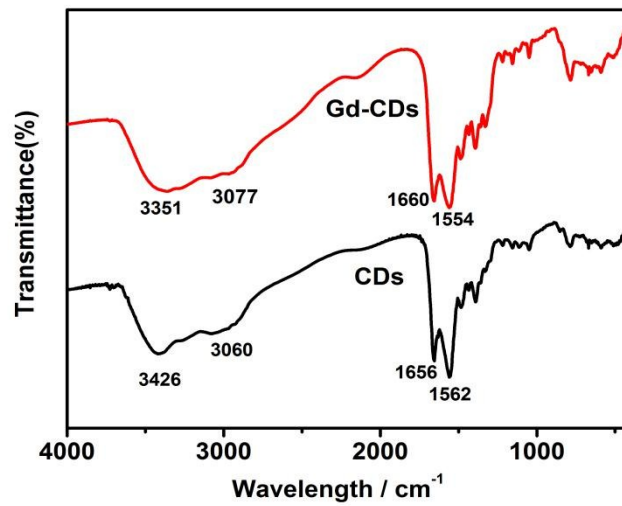


Figure S3 FTIR spectra of CDs and Gd-CDs (KBr pellet).

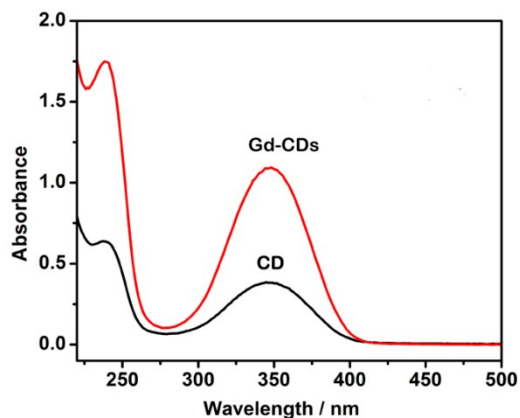


Figure S4 Absorption spectra of CDs and Gd-CDs in aqueous solution.

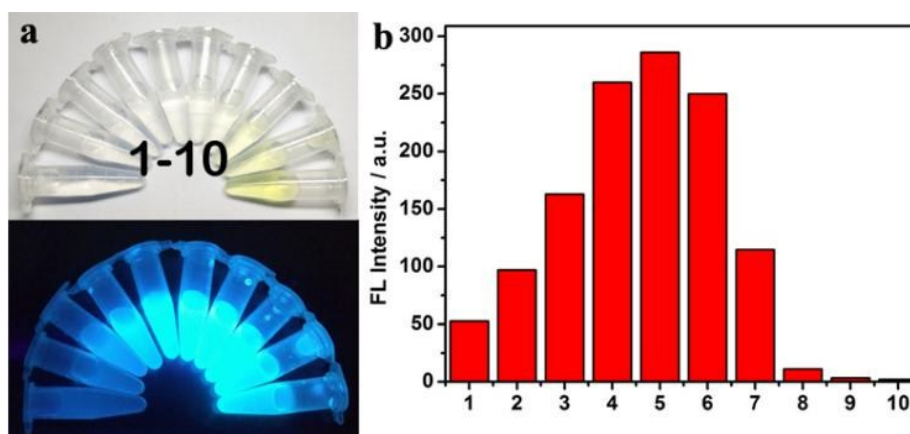


Figure S5 a) Photographs taken under visible light (left upper) and UV light with a wavelength of 365 nm (left bottom) of Gd-CDs (From 1-10: 0.00625, 0.0125, 0.025, 0.05, 0.1, 0.2, 0.4, 0.8, 1.6, 3.2 mM); b) Fluorescence intensity of Gd-CDs at different concentrations.

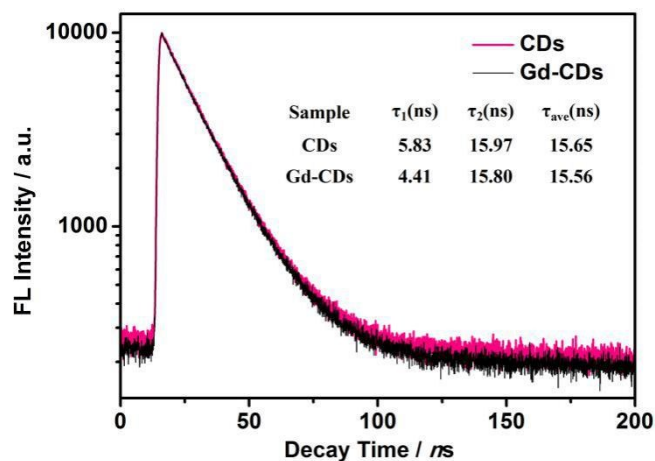


Figure S6 Fluorescence decay profiles of CDs and Gd-CDs. The average lifetime of CDs is 15.65 ns and contains two lifetime components: 5.83 ns (~3.12%) and 15.97 ns (~96.88%). The average lifetime of Gd-CDs is 15.56 ns and contains two lifetime components: 4.41 ns (~2.10%) and 15.80 ns (97.90%) (the delay time at 450 nm emission). The fluorescence decay curves determined at the excitation of 360 nm were both fitted to a double-exponential function, and the

average lifetime was calculated according to $\langle \tau \rangle = \frac{\sum A_i \tau_i^2}{\sum A_i \tau_i}$.

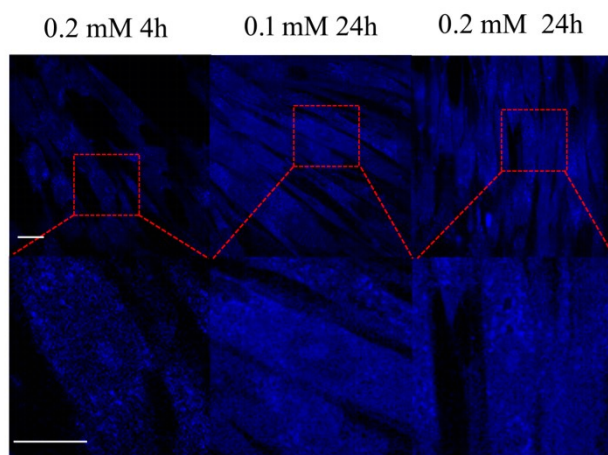


Figure S7 Confocal fluorescence images of hMSCs incubated with Gd-CDs. Scale bars: 30 μ m.

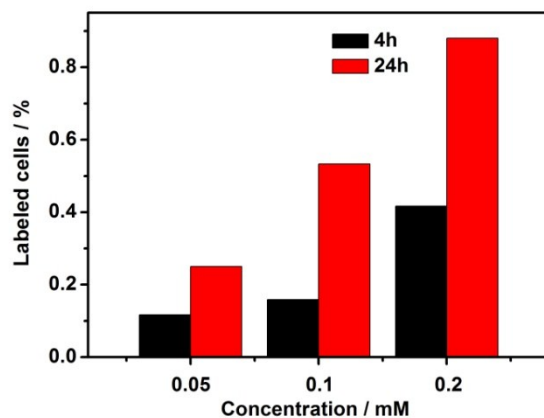


Figure S8 The percentage of labeled hMSC after incubating with appropriate medium contain 0.05, 0.1, 0.2 mM of Gd-CDs for different time.

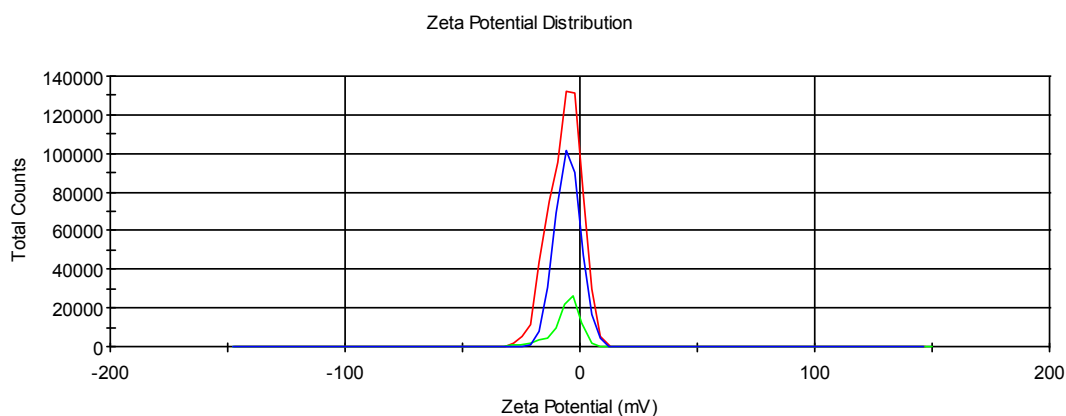


Figure S9 The zeta potential of Gd-CDs (25°C).

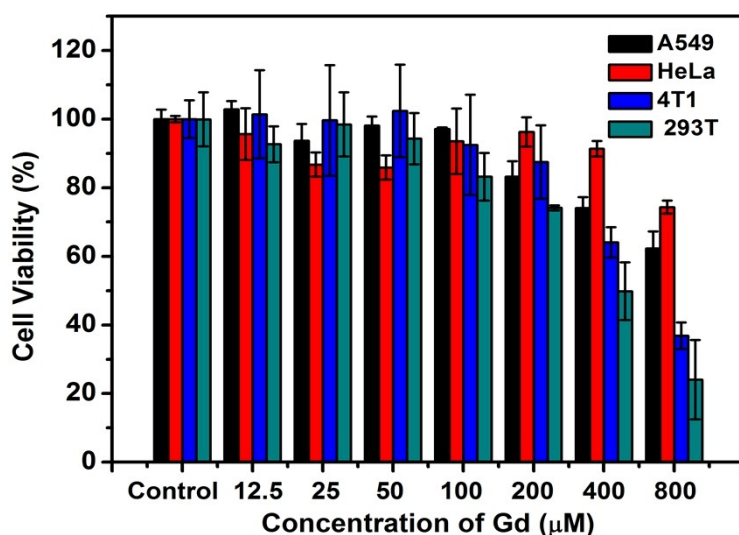


Figure S10 Relative cell viability of four different types of cell lines (HeLa, 4T1, A549, 293T) treated with Gd-CDs at different concentrations for 24h.

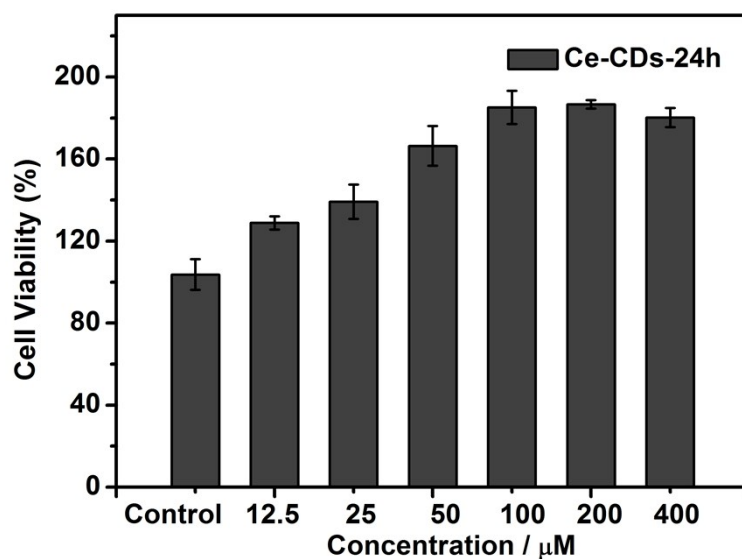


Figure S11 Relative cellular viability of hMSCs incubated with Ce-CDs at different concentrations for 24h.

Table S1 The imaging modalities and proliferation effect of a variety of materials to hMSC.

materials	Imaging modalities	Proliferation effect	Reference
PVA-Gd	T_1 MR	No	Bioconjugate Chem. 2014, 25, 1243-1251
Ln-nanorods	FL Imaging	differentiation	J. Mater. Chem. B, 2014, 2, 3609-3617
Gd@US-tube	T_1 MR	No	Nanoscale, 2015,7, 12085-12091
Ag ₂ S QD	NIR FL Imaging	No	Adv. Funct. Mater. 2014, 24, 2481-2488
AuNP & AuNR	ultrasound/photoacoustic imaging	No	J. Mater. Chem. B, 2014, 2, 8220-8230
FPMNs	T_2 & FL	No	J. Mater. Chem., 2008, 18, 4402-4407
Gd-CDs	T_1 MR & FL	Yes	This work