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Toward Strong Near-Infrared Absorption/Emission from Carbon Dots in Aqueous Media through Solvothermal Fusion of Large Conjugated Perylene Derivatives with Post-Surface Engineering

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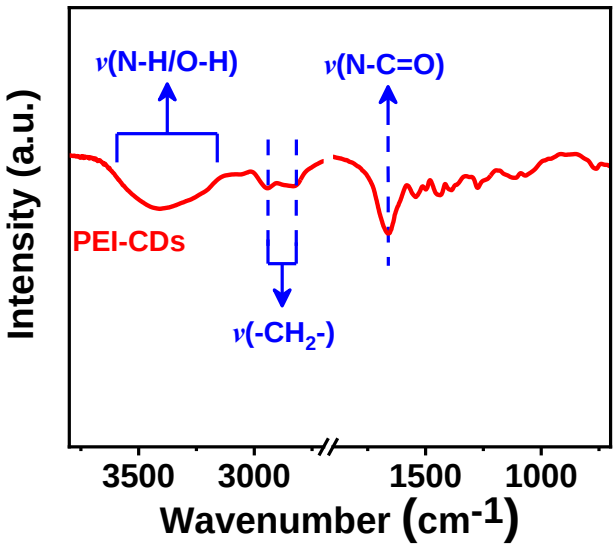
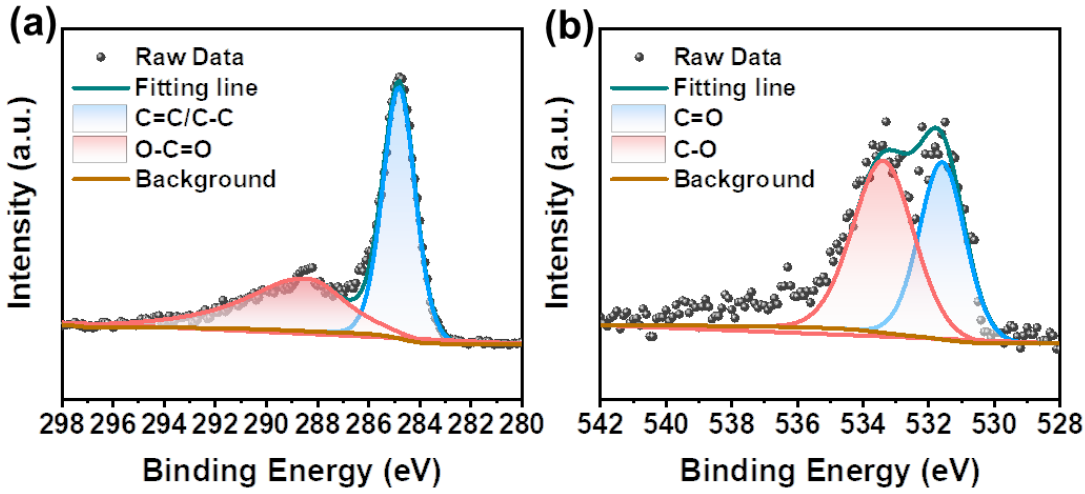


Figure S1. FT-IR spectrum of PEI-CDs.



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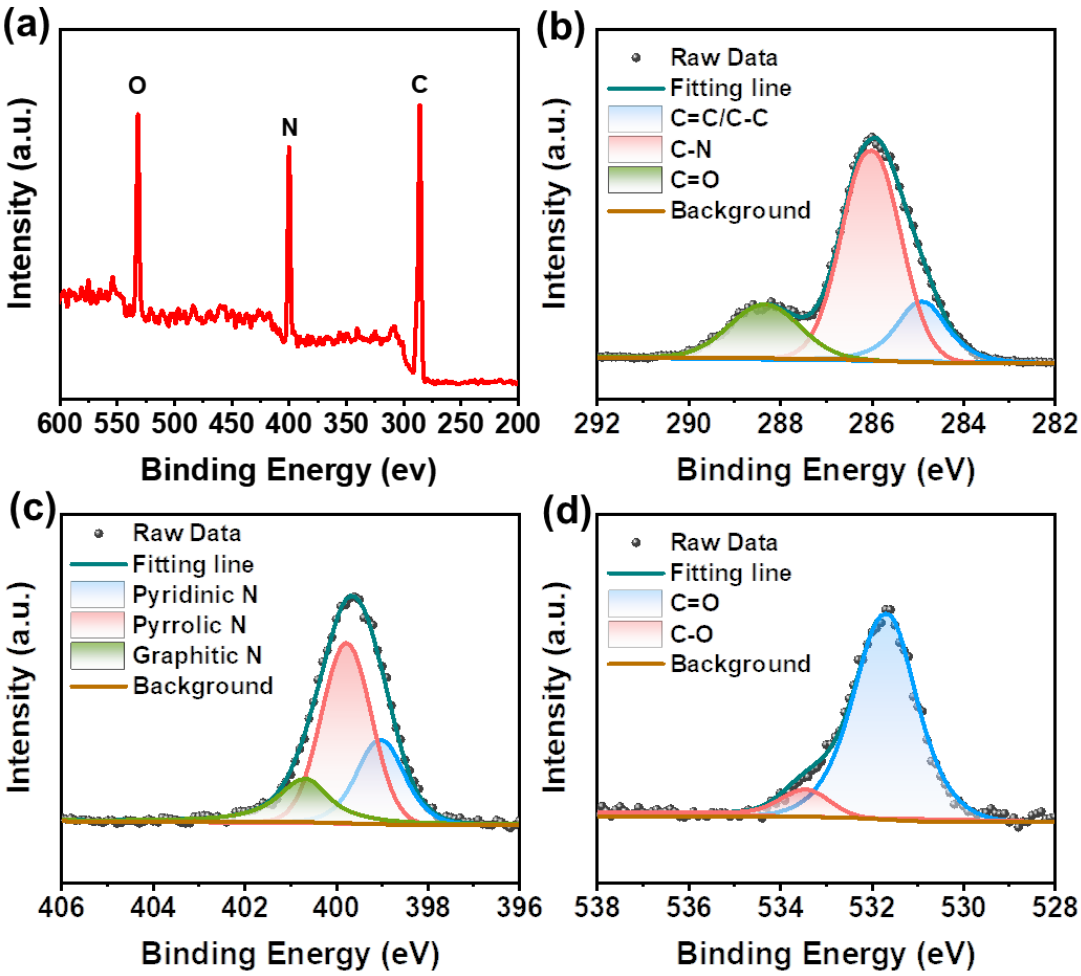

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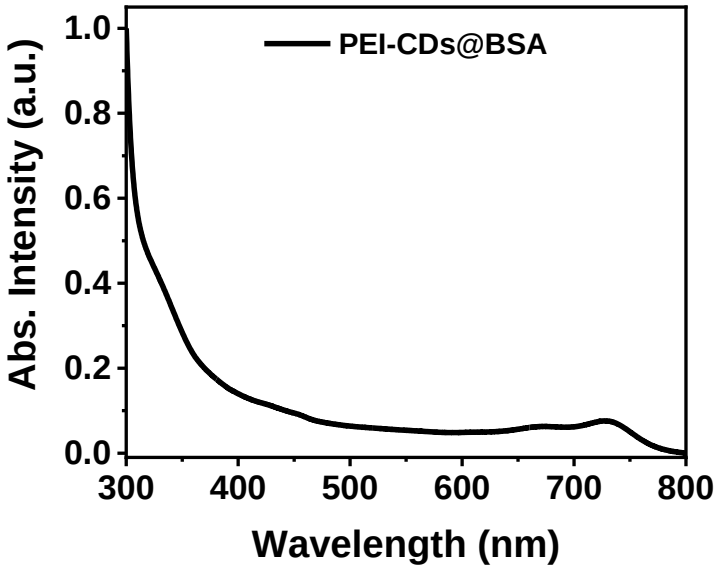
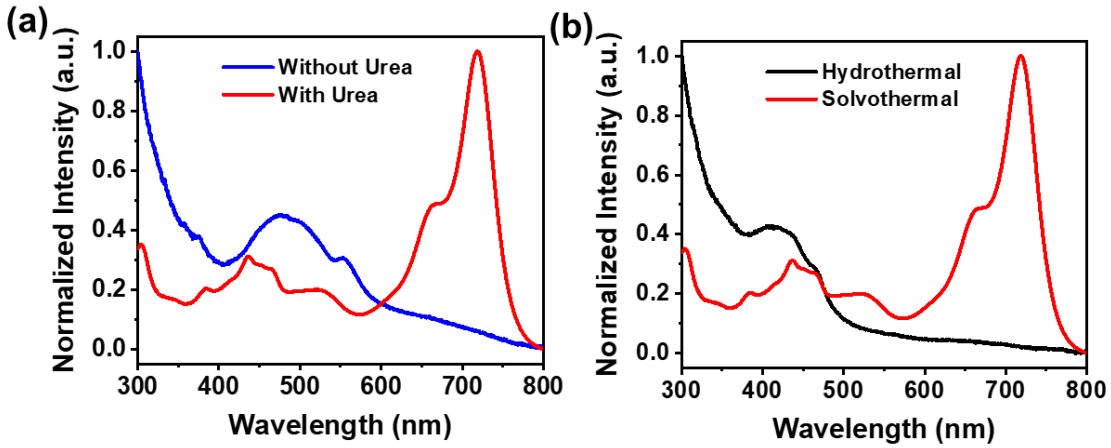


Figure S4. UV-vis absorption spectrum of PEI-CDs@BSA in H_2O.



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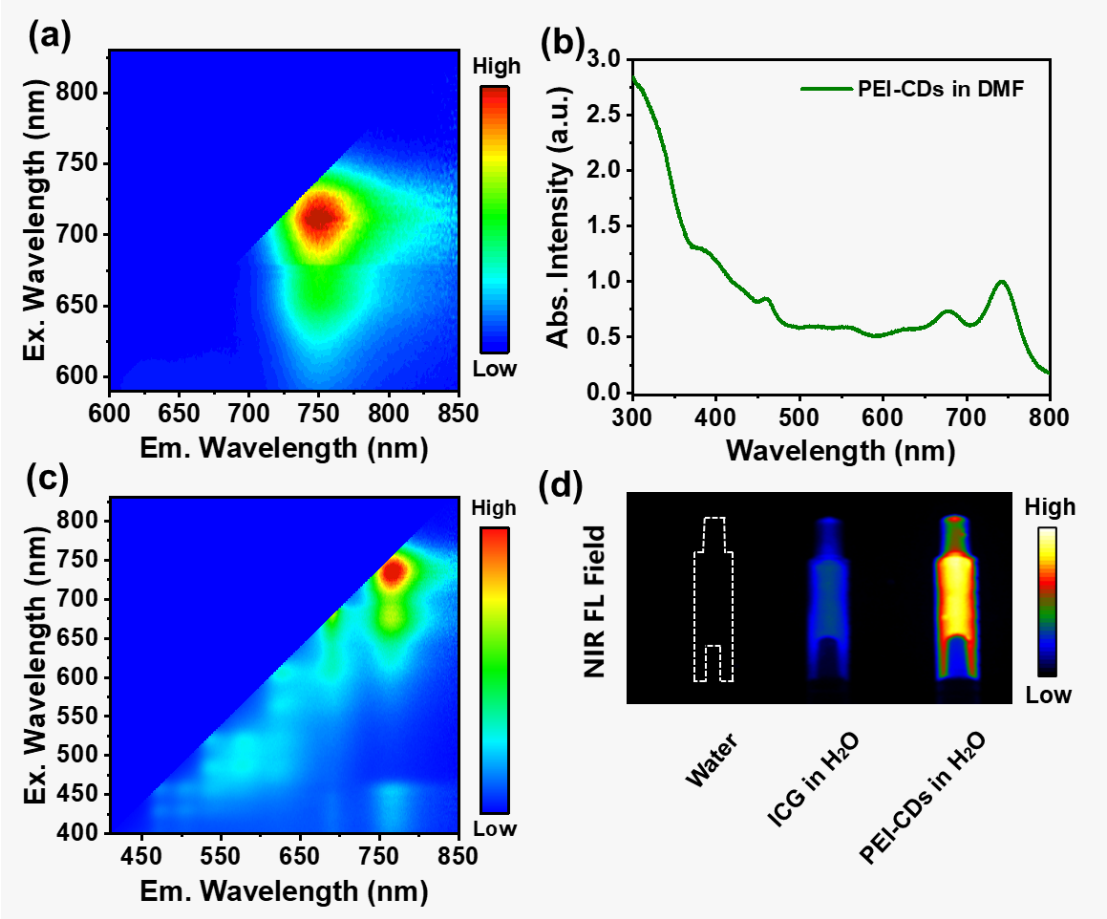

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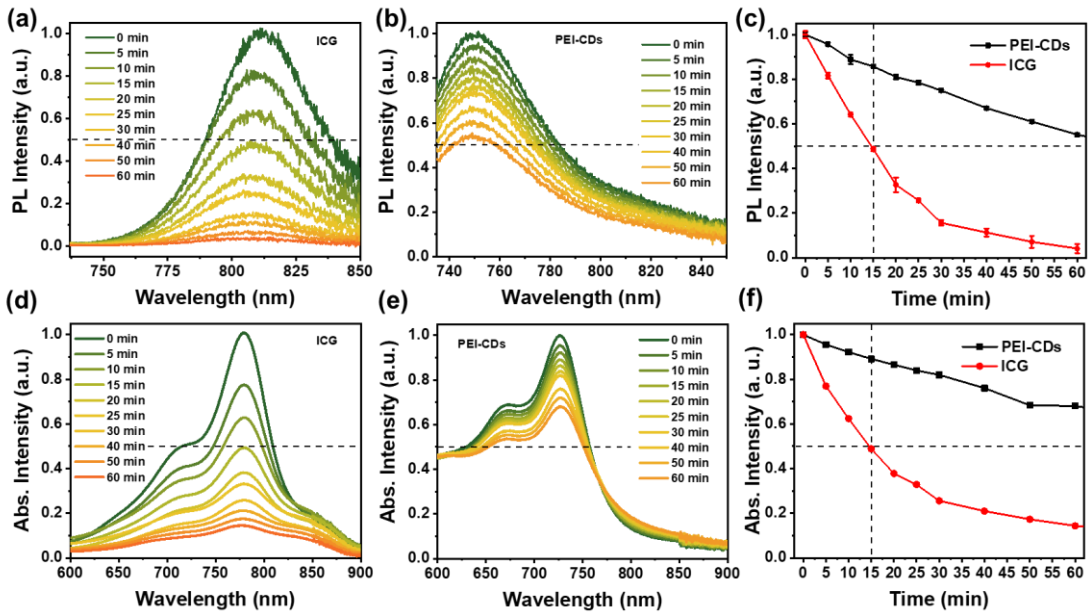

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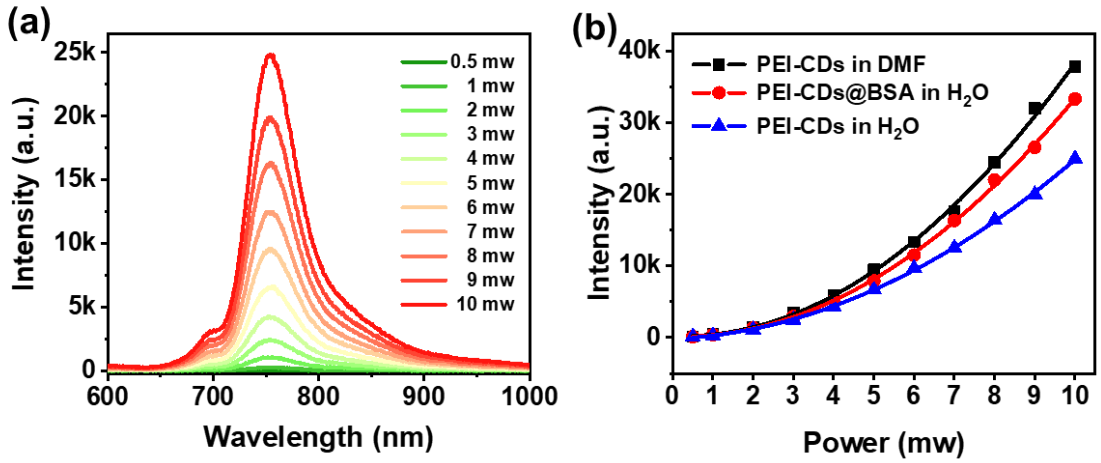

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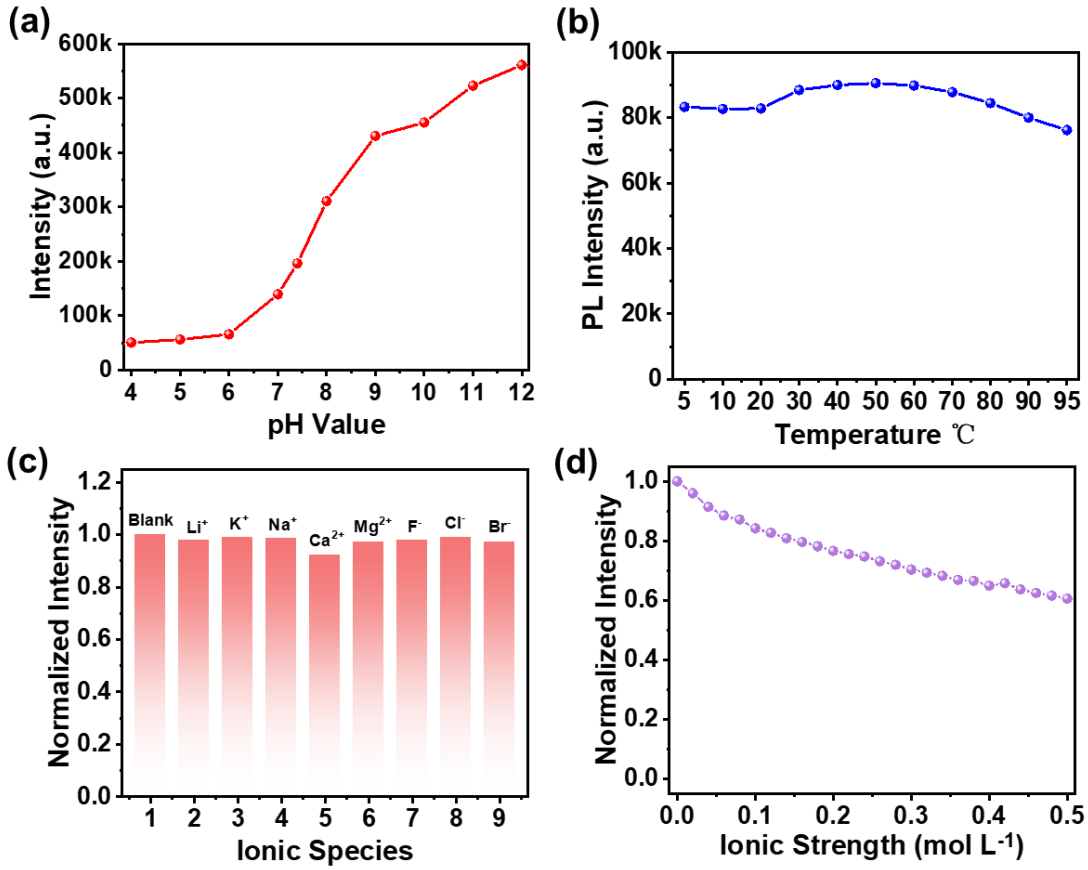

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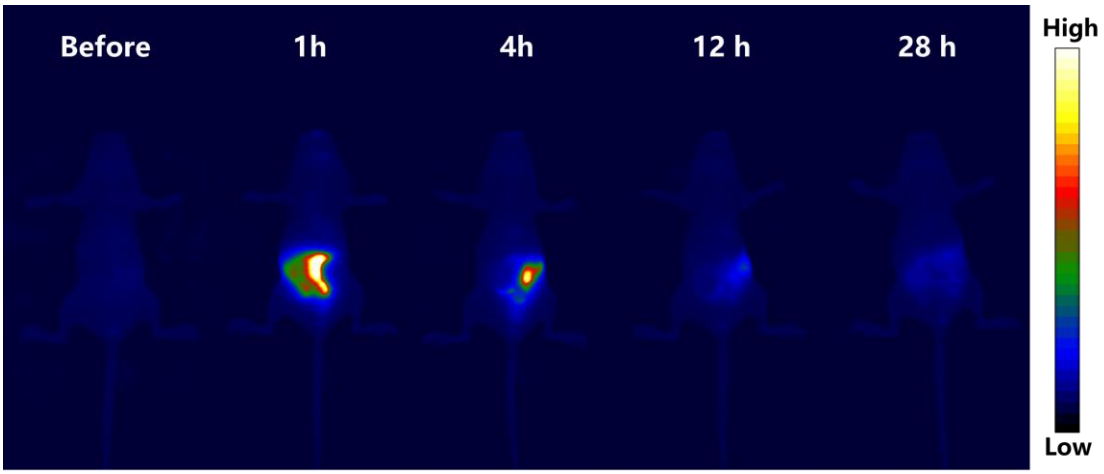

Figure S10. In vivo NIR fluorescence images of a mouse before and after different time gavage injection of PEI-CDs aqueous solution (400 μL, 15 mg mL^{-1}). The imagings were recorded with a 750 nm long-pass optical filter under the excitation of 690 nm.

Figure S11. The Wattcas autoclave (WP-MSAR-250A) for solvothermal reactions.

Ref.	Main Abs. peak / nm	Main PL peak / nm	NIR λem / nm (λex / nm)	NIR PLQY in aqueous media	Published Journal Year
This Work	720	745	745 (λex 720)	3.3% (CDs) 5.3% (PEI-CDs) 8.3% (PEI-CDs@BSA)	-
1	UV region	440	925 (λex 808 laser)	0.4%	ACS Appl. Mater. Interfaces 2019
2	UV region	470	1000 (λex 808 laser)	~1%	Appl. Mater. Today 2019
3	UV region	532	950 (λex 808 laser)	1.34%	2D Mater. 2021
4	UV region	532	728 (λex 300)	N/A[a]	ACS Appl. Mater. Interfaces 2018
5	UV region	410	915 (λex 808 laser)	N/A	ACS Nano 2014
6	UV region	475	N/A	N/A	Carbon 2018
7	UV region	470	N/A	N/A	Carbon 2020

[a] N/A: not available.

Table S1. Comparison of optical properties of carbon dots with near-infrared absorption/emission in aqueous media.

	Cost	Total	Ref.
ICG	¥25,160 / 1g	¥25,160 / 1g	8 (package 250mg)

	Cost	Total	
Urea	¥0.71 / 1g		9 (package 500g)
PTCDA	¥1.93 / 0.2g		10 (package 100g)
PEI	¥4.84 / 1mL (50% w/w)		11 (package 250mL)
DMF	¥28.12 / 20mL		12 (package 1L)
PEI-CDs	¥35.60 / 0.3 g	¥118.67 / 1g	

Table S2. Price comparison of PEI-CDs and commercial NIR dye Indocyanine green (ICG).

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