

Supporting Information

Red-emissive carbon nanodots for highly sensitive ferric(III) ion sensing and intracellular imaging

Ruhong Yan,^{ab} Zhenzhen Guo,^{ac} Xifeng Chen,^{ad} Longhai Tang,^e Mingyuan Wang,^{*e} and Peng Miao^{*ac}

^a Suzhou Institute of Biomedical Engineering and Technology, Chinese Academy of Sciences, Suzhou 215163, China

^b Department of Clinical Laboratory, the Affiliated Suzhou Science & Technology Town Hospital of Nanjing Medical University, Suzhou 215153, China

^c Ji Hua Laboratory, Foshan 528200, China

^d Jinan Guokeyigong Science and Technology Development Co., Ltd., Jinan 250103, China

^e Suzhou Blood Center, Suzhou 215006, China

* Corresponding authors. Tel.: +86-512-69588279.

E-mail addresses: mingyuan98@aliyun.com (M. Y. Wang); miaopeng@sibet.ac.cn (P. Miao).

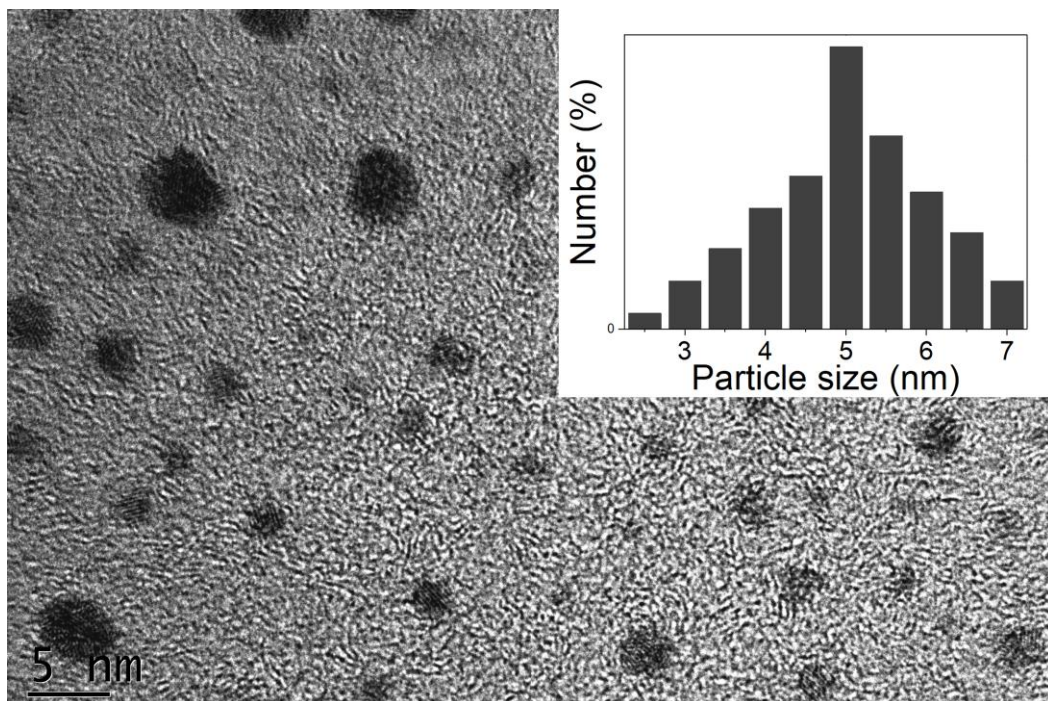


Figure S1. TEM image of carbon nanodots.

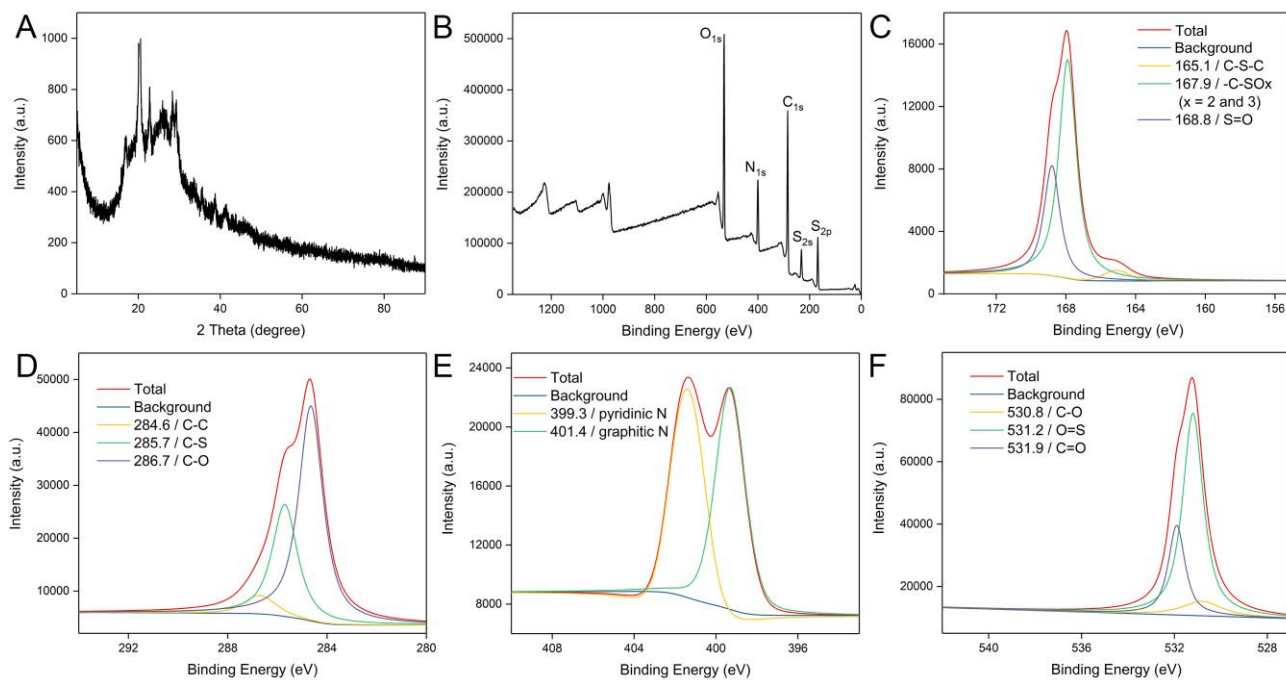


Figure S2. (A) XRD pattern and (B) XPS scanning spectrum of the carbon nanodots. XPS high-resolution survey scans of (C-F) S_{2p}, C_{1s}, N_{1s}, O_{1s} regions.

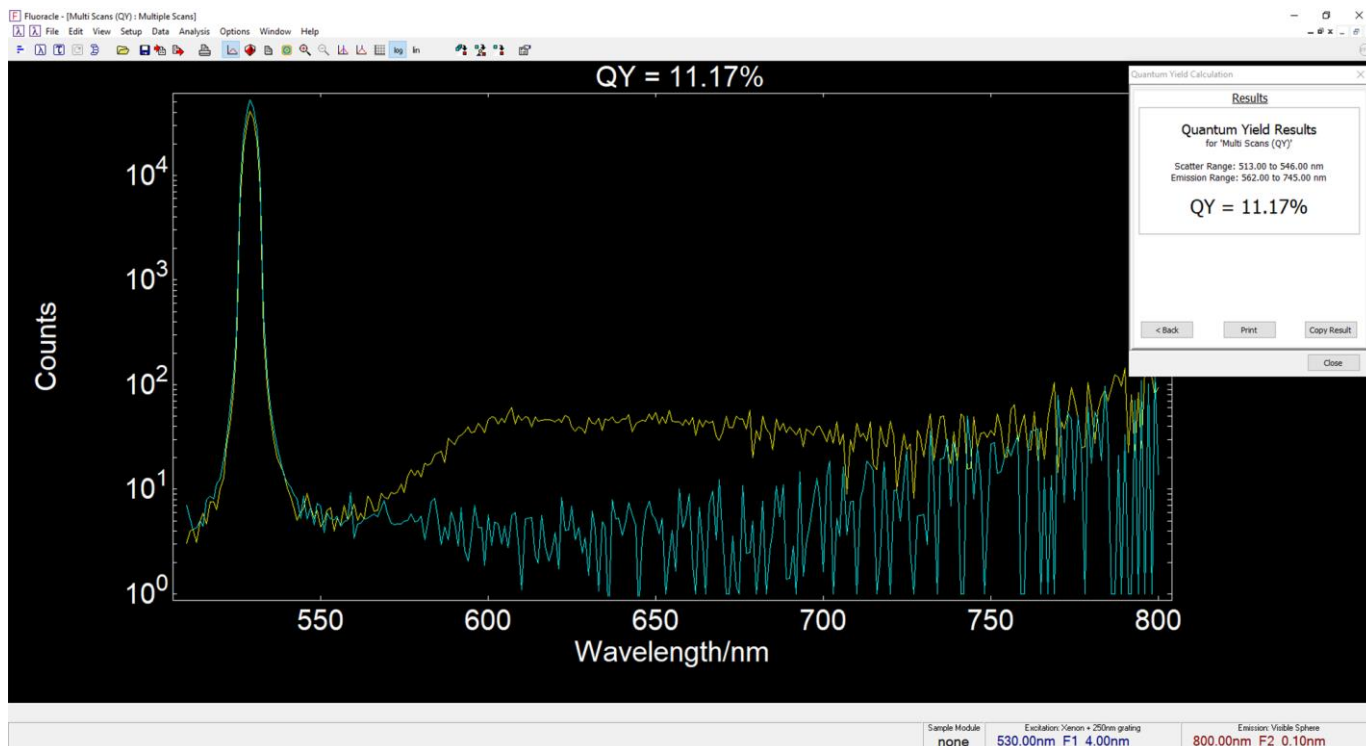


Figure S3. Fluorescence emission spectra of carbon nanodots and reference water with the Y-axis of logarithmic photon counts.

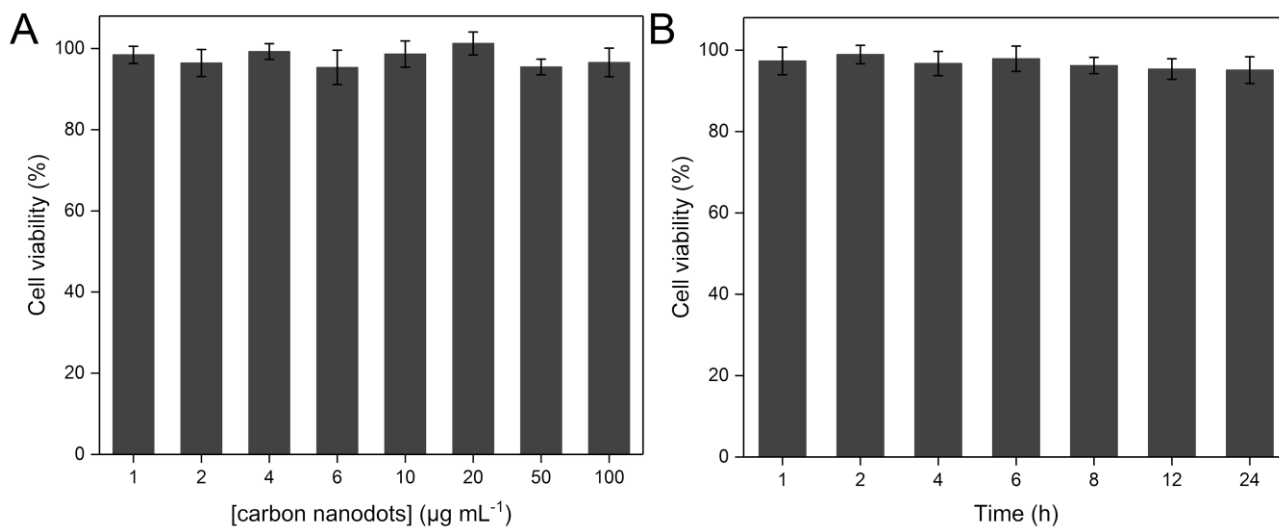


Figure S4. Viability of cells towards different (A) concentrations and (B) incubation times of carbon nanodots.

Table S1. Quantum yields of red-emissive nanomaterials.

type	main reagents	synthesis method	quantum yield (%)	ref
graphene	graphene oxide	hydroxyl-radical-induced decomposition	1	1
quantum dots				
carbon nanodots	polythiophene phenylpropionic acid	hydrothermal method	2.3	2
carbon nanodots	p-phenylenediamine	hydrothermal method	3.4	3
carbon nanodots	polythiophene benzoic acid	hydrothermal method	3.5	4
graphene	polythiophene derivatives	hydrothermal method	3.92	5
quantum dots				
carbon nanodots	urea and citric acid	solvothermal method	4	6
carbon nanodots	melamine and dithiosalicylic acid	solvothermal method	5.96	7
carbon nanodots	citric acid and ethylenediamine	hydrothermal method	8.29	8
carbon nanodots	2,5-diaminotoluene sulfate	solvothermal method	9	9
carbon nanodots	p-phenylenediamine and phosphorus acid	hydrothermal method	11.2	10
carbon nanodots	melanin	hydrothermal method	18	11
carbon nanodots	ammonium fluoride and o-phenylenediamine	microwave method	11.17	this

Table S2. Recovery assay of Fe³⁺ in real water samples by the proposed method.

Sample	Spiked (μM)	Detected (μM)	RSD (%)	Recovery (%)
lab's tap	20	20.4	0.5	102.0
	80	70.5	0.4	88.1
pond	20	22.2	1.5	111.0
	80	84.6	0.5	105.8
river	20	20.3	0.2	101.5
	80	75.7	0.9	94.6

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