Supporting Information

Graphene Quantum Dots Based Fluorescence Turn-On Nanoprobe for Highly Sensitive and Selective Imaging of Hydrogen Sulfide in Living Cells

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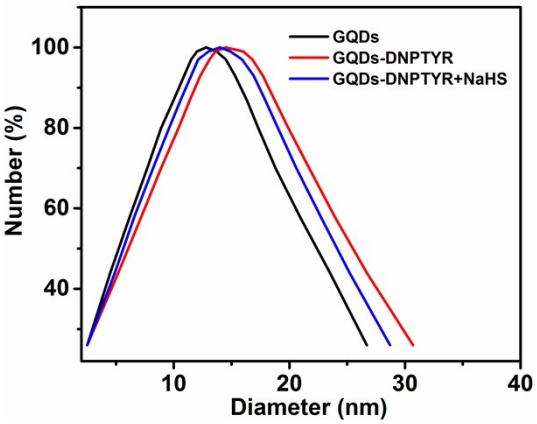

Figure S1. Dynamic light scattering measurements of 0.1 mg/mL bare GQD and GQD-DNPTYR as well as GQD-DNPTYR with 10 μM NaHS, respectively.

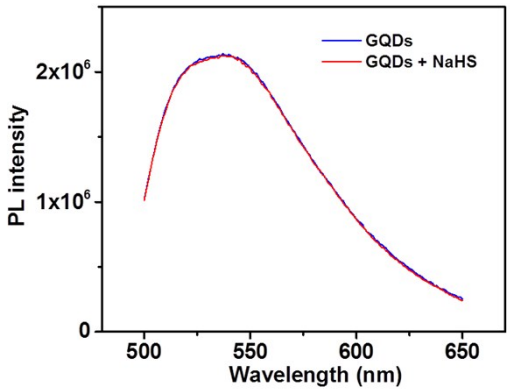

Figure S2. Photoluminescence (PL) spectra of a bare GQD suspension (in PBS buffer solution, pH 7.0) and its containing NaHS (100 μM) at an excitation wavelength of 480 nm.

Table S1 Response time of H_2S detection: our method *vs.* others.

Method	Probe	Response time (min)	Reference
Colorimetry	Au Nanoparticles	16	ACS Appl. Mater. Interfaces, 2014, 6, 6300−6307
Colorimetry	Au Nanoparticles	15	Anal. Chem., 2015, 87, 7267−7273
Colorimetry	Nitrobenzofurazan thioethers based organic molecule	30	J. Org. Chem., 2013, 78, 6550−6557
Colorimetry	Polydimethylsiloxane-Ellman's reagent	20	Anal. Chem., 2012, 84, 5243−5249
Fluorescence	Cu(II)-metalated Nano-MOF	15	Anal. Chem., 2014, 86, 11459−11463
Fluorescence	CdTe QDs@SiO_2	15	ACS Appl. Mater. Interfaces, 2015, 7, 3547−3553
Fluorescence	CdSe/CdZnS core/shell QDs	20	Anal. Chem., 2016, 88, 6050−6056
Fluorescence	hsGFP	40	Biochemistry, 2014, 53, 5966−5974
Fluorescence	1,8-naphthalimide-derived organic molecule	20	Org. Lett., 2013, 15(9),2310-2313
Fluorescence	azido based organic molecule	60	Anal. Chem., 2016, 88, 592−595
Fluorescence	piperazine-based naphthalimide scaffold	40	Anal. Chem., 2016, 88, 5476−5481
Fluorescence	HSN2 benzyl-guanine conjugate	30	Anal. Chem., 2016, 88, 5769−5774
Fluorescence	enone and aldehyde functionalized organic molecule	15	Anal. Chem., 2015, 87, 1188−1195
Fluorescence	4-amino-1,8-naphthalimide and 4-azidobenzyl carbamate based organic molecule	120	J. Org. Chem., 2014, 79, 9481−9489
Fluorescence	Michael acceptor-based fluorescent organic molecule	30	Org. Lett., 2012, 14(8), 2184-2187
Fluorescence	GQD-DNPTYR	10	This assay

Table S2 H_2S detection: our method *vs.* others.

Method	Probe	Linear range (M)	Limit of Detection(M)	Reference
Colorimetry	Au NPs	5×10^{-8} to 4×10^{-7}	3×10^{-8}	ACS Appl. Mater. Interfaces, 2014, 6, 6300–6307
Colorimetry	Au NPs	3×10^{-6} to 1×10^{-5}	2×10^{-7}	Anal. Chem., 2015, 87, 7267–7273
Colorimetry	Au Nanorods	2×10^{-5} to 1×10^{-4}	2.4×10^{-5}	Anal.Chim.Acta.,2011, 708, 130–133
Colorimetry	Au@Pt NPs	1×10^{-8} to 1×10^{-7}	7.5×10^{-9}	Anal. Chem., 2015, 87, 10153–10160
Colorimetry	Cu@Au NPs	0 to 1×10^{-5}	3×10^{-7}	ACS Appl. Mater. Interfaces, 2011, 3, 2928–2931
Colorimetry	N,N-dimethyl-p-phenylenediamine	1.7×10^{-6} to 8.8×10^{-6}	1.7×10^{-6}	Anal. Chem., 2012, 84, 10038−10043
Colorimetry	tricyanoethylene derivate	0 to 1.3×10^{-4}	—	Analyst, 2012,137, 5576−5580
Colorimetry	7-nitro-1,2,3-benzoxadiazole	—	1.9×10^{-7}	J. Org. Chem., 2013, 78, 6550–6557
Colorimetry	tetraphenylethylene	1×10^{-7} to 8×10^{-4}	1.28×10^{-8}	Anal. Chem., 2015, 87, 8964–8969
Electro-chemiluminescent	Ruthenium(II) complex	5×10^{-7} to 1×10^{-5}	2.5×10^{-7}	Anal. Chem., 2015, 87, 1839–1845
Fluorescence	CdTe@SiO_2	0 to 2×10^{-6}	7×10^{-9}	ACS Appl. Mater. Interfaces, 2015, 7, 3547–3553
Fluorescence	Iridium(III)@SiO_2	4.5×10^{-5} to 3.5×10^{-4}	2.7×10^{-6}	ACS Appl. Mater. Interfaces, 2015, 7, 5462–5470
Fluorescence	nano-MOF	0 to 1×10^{-4}	1.6×10^{-8}	Anal. Chem., 2014, 86, 11459–11463
Fluorescence	AMP/Ti/Ag	1×10^{-6} to 1.2×10^{-4}	3×10^{-7}	Anal. Chem., 2013, 85, 11020–11025

Fluorescence	Merocyanines@SiO_2	0 to 1.15×10^{-4}	5.8×10^{-7}	ACS Appl. Mater. Interfaces, 2014, 6, 11013–11017
Fluorescence	cysteine-capped Cu nanoclusters	2×10^{-7} to 5×10^{-5}	4.2×10^{-8}	Analyst, 2015,140, 2719-2725
Fluorescence	Au nanodots	5×10^{-7} to 1.57×10^{-4}	5×10^{-7}	Nanoscale, 2013,5, 4683-4686
Fluorescence	naphthalimide azide - capped carbon dots	—	1×10^{-8}	Chem. Commun., 2013,49, 403-405
Fluorescence	organic fluorescent probe	1×10^{-6} to 1×10^{-4}	1×10^{-6}	Org. Lett., 2012, 14 (8), pp 2184–2187
Fluorescence	Coumarin-merocyanine fluorescent probe	0 to 2×10^{-4}	1×10^{-6}	Angew.Chem.Int.Ed. 2013, 52, 1688 –1691
Fluorescence	azide-based fluorescent probe	0 to 1×10^{-3}	—	Anal. Chem., 2016, 88, 592–595
Fluorescence	piperazine-based naphthalimide scaffold	0 to 1×10^{-4}	2.46×10^{-6}	Anal. Chem., 2016, 88, 5476–5481
Fluorescence	benzaldehyde derived from acedan	1×10^{-7} to 5×10^{-5}	5×10^{-8}	Anal. Chem., 2015, 87, 1188–1195
Fluorescence	fluorescent protein (cpGFPTyr66pAzF)	1×10^{-5} to 5×10^{-5}	—	J. Am. Chem. Soc., 2012, 134, 9589–9592
Fluorescence	benzimidazole-Cu^{2+} complex	0 to 1×10^{-5}	1.1×10^{-7}	Inorg. Chem., 2015, 54, 3766–3772
Fluorescence	Tb^{3+}/Eu^{3+} Lanthanide Complexes	5×10^{-6} to 3×10^{-2}	3.5×10^{-9}	Anal. Chem., 2014, 86, 11883–11889
Fluorescence	azidoluciferin	1×10^{-5} to 1×10^{-3}	1×10^{-7}	Anal. Chem., 2015, 87, 11325–11331
Fluorescence	1,8-naphthalimide-derived fluorophore	0 to 1×10^{-4}	4.8×10^{-7}	Org. Lett., 2013, 15, 2310–2313
Fluorescence	pyridine–biquinoline–metal complexes	—	2.24×10^{-6}	Anal. Chem., 2015, 87, 2678–2684
Fluorescence	GQD-DNPTYR	2×10^{-9} to 1.5×10^{-6}	8.9×10^{-10}	This assay