New Aspects of the Environmental Risks of Quantum Dots: Prophage Activation

Juan Xu[1], Ying-Ying Wang[1], Ren Yan[1], Lian-Jiao Zhou[1], Yu-zhu Liu[1], Feng-Lei Jiang[1],*, Thomas Maskow[2],* Yi Liu[1,3,4],*

[1] State Key Laboratory of Virology & Key Laboratory of Analytical Chemistry for Biology and Medicine (MOE), College of Chemistry and Molecular Sciences, Wuhan University, Wuhan 430072, P. R. China

[2] UFZ, Helmholtz Centre for Environmental Research, Department of Environmental Microbiology, Permoserstr. 15, 04318 Leipzig, Germany

[3] Key Laboratory of Coal Conversion and Carbon Materials of Hubei Province, College of Chemistry and Chemical Engineering, Wuhan University of Science and Technology, Wuhan 430081, P. R. China

[4] College of Chemistry and Material Sciences, Guangxi Teachers Education University, Nanning 530001, P. R. China

*Corresponding Author.Tel: 86-27-68756667. Fax: 86-27-68754067. Email address: yiliuchem@whu.edu.cn, thomas.maskow@ufz.de, fljiang@whu.edu.cn.
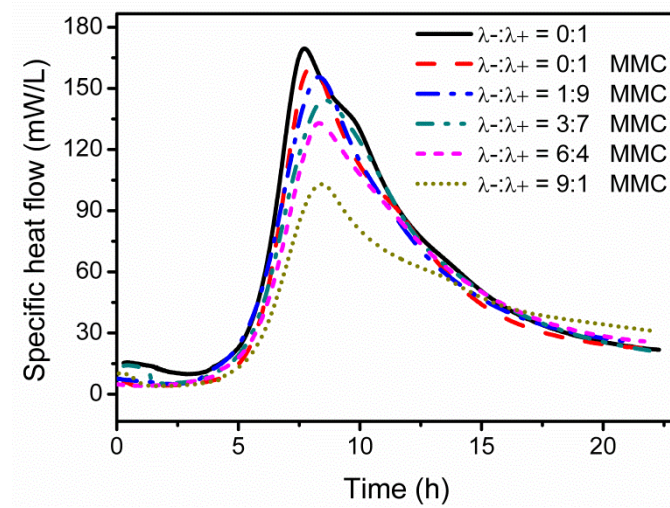
Figure S1. Dependency of the metabolic heat production rate of *E. coli* with different ratio of λ+ at the same concentration of Mitomycin C (15 μM, MMC).
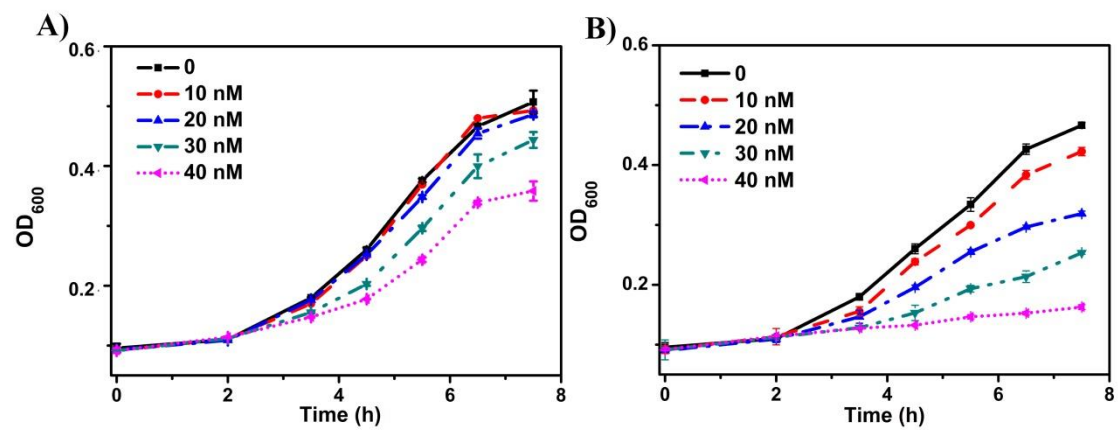
Figure S2. (A) Growth curves of normal *E. coli* (λ-) treated with GSH-CdTe QDs. (B) Growth curves of mixture *E. coli* (λ- : λ+ = 9 : 1) treated with GSH-CdTe QDs.
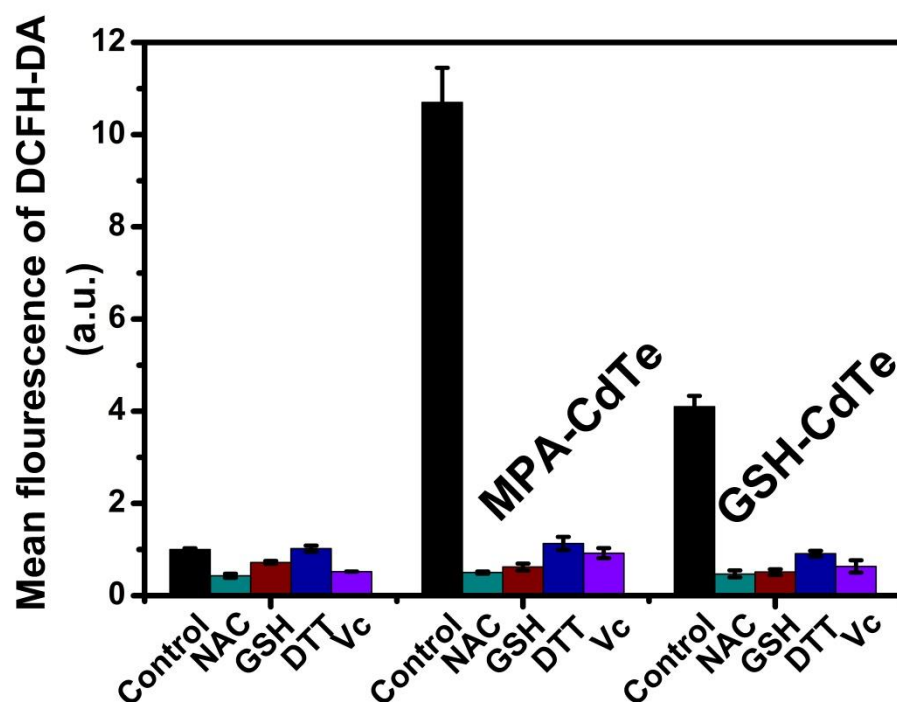
Figure S3. Treatments of antioxidants suppress the accumulation of reactive oxygen species (ROS) formation of MPA-CdTe and GSH-CdTe QDs.
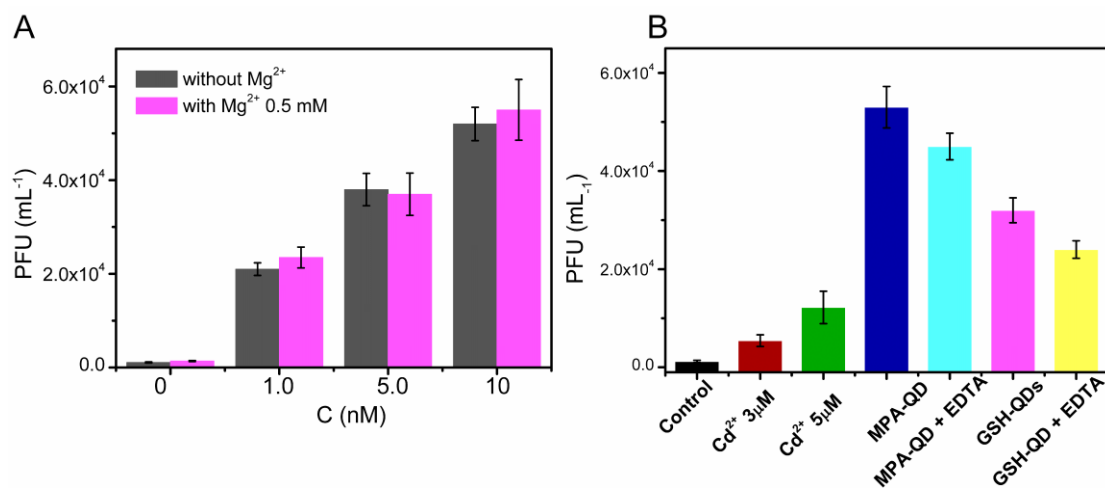
Figure S4 (A) Prophage activation of MPA-CdTe QDs in medium without and with Mg^{2+}. (B) Protective effect of EDTA on CdTe QDs against prophage activation in medium without Mg^{2+}.

Table S1. Parameters of *E. coli* growth at different concentrations of GSH-QDs.

E. coli	C (μM)	k_1 (h^{-1})	R	P_m (μW)	Q_{total} (J)
	0	1.012	0.998	304.8	11.2
	0.1	0.932	0.992	322.4	10.7
Lambda-	0.4	1.160	0.996	319.1	9.6
	0.8	0.943	0.992	296.4	10.5
	1.6	1.072	0.995	332.0	11.2
	0	0.911	0.991	325.4	10.4
	0.1	0.775	0.992	310.6	10.5
Mixture	0.4	0.644	0.995	287.0	10.1
	0.8	0.621	0.997	278.2	10.7
	1.6	0.571	0.993	256.0	10.3

Table S2. Parameters of *E. coli* growth at different concentrations of MPA-QDs.

E. coli	C (μM)	k_1 (h^{-1})	R	P_m (μW)	Q_{total} (J)
Lambda-	0	0.925	0.996	331.4	10.9
	0.2	0.879	0.993	327.1	10.1
	0.4	0.921	0.996	327.4	10.6
	0.6	0.913	0.994	323.4	10.4
	0.8	0.859	0.999	319.8	10.0
Mixture	0	0.857	0.992	341.8	11.6
	0.2	0.679	0.996	343.6	11.9
	0.4	0.643	0.992	304.8	11.1
	0.6	0.631	0.999	250.2	11.4
	0.8	0.602	0.994	252.7	11.3