

Electronic Supplementary Information (ESI†)

The permeability and transport mechanism of graphene quantum dots (GQDs) across the biological barrier

Xin-yi Wang,^{a,d} Rong Lei,^b Hong-duang Huang,^c Na Wang,^a Lan Yuan,^{*a} Ru-yue Xiao,^a
Li-dan Bai,^a Xue Li,^a Li-mei Li^d and Xiao-da Yang^{*a}

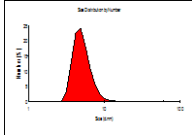
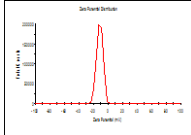
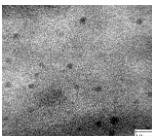
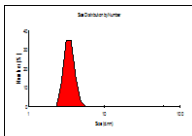
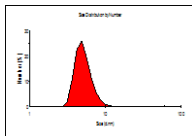
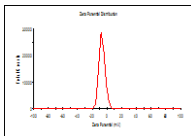
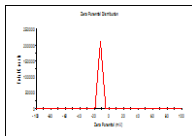
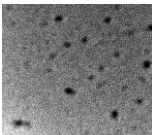
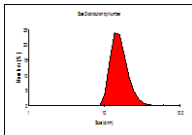
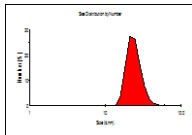
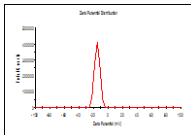
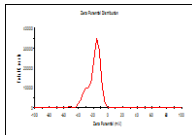
^a State Key laboratories of Natural and mimetic drugs and Department of Chemical Biology, School of Pharmaceutical Sciences, Peking University, Beijing 100083, China. Fax: +86-10-62015584; Tel: +86-10-82801539; E-mail: xyang@bjmu.edu.cn;

^b Institute of Plant Quarantine of China, Chinese Academy of Inspection and Quarantine, Beijing 100029, China;

^c College of Chemistry and Molecular Engineering, Peking University, Beijing 100871, China.

^d College of Sciences, Shenyang Agricultural University, Shenyang 110161, China.

Table S1. The hydrodynamic size of GQDs in the absence or presence of BSA

GQDs	Sizes (nm)			Zeta potential	
	On TEM	In solution	+BSA	In solution	+BSA
BSA		5.1 ± 1.4		-11.2 ± 4.2	
					
3 nm	3.3 ± 0.7	3.4 ± 0.05	5.2 ± 1.3	-6.7 ± 3.9	-11.7 ± 2.7
					
12 nm	12.5 ± 3.6	16.2 ± 4.4	23.9 ± 5.2	-14.9 ± 3.6	-16.0 ± 5.4
					

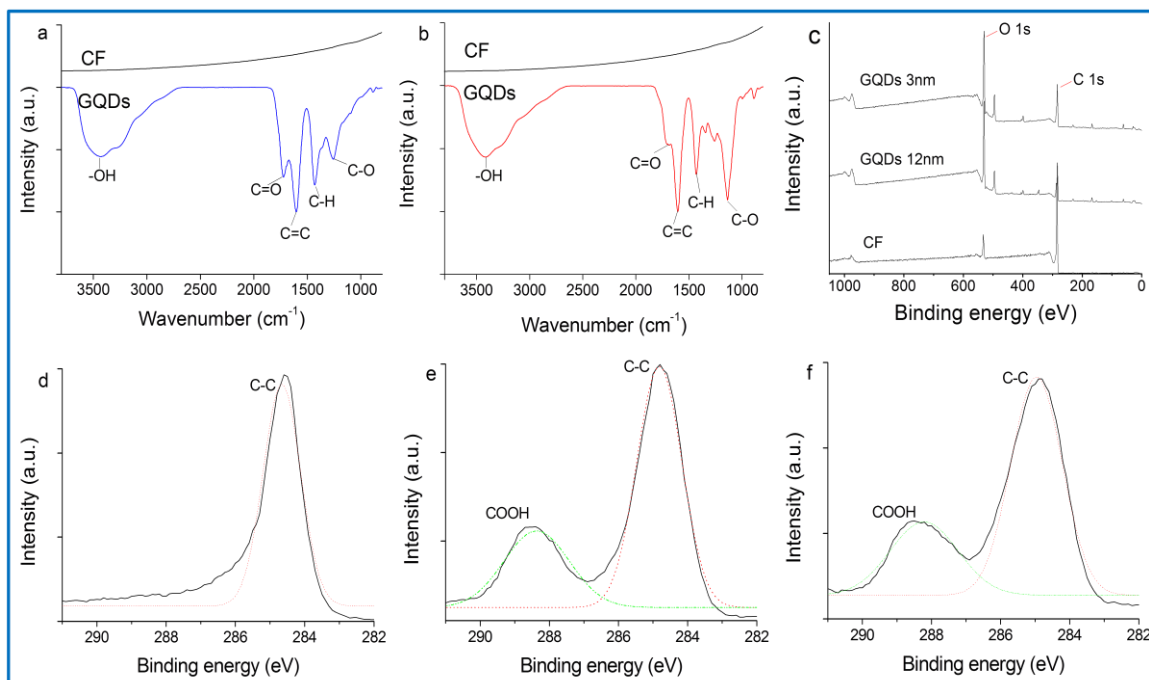


Fig.S1 (a) FTIR spectra of CF and GQDs with the diameter of 3 nm; (b) FTIR spectra of CF and GQDs with the diameter of 12 nm; (c) XPS survey spectra of CF and GQDs with the diameters of 3 nm and 12 nm; (d), (e) and (f) represent high-resolution XPS C1 spectra of CF, 3 nm-GQDs and 12 nm-GQDs respectively.

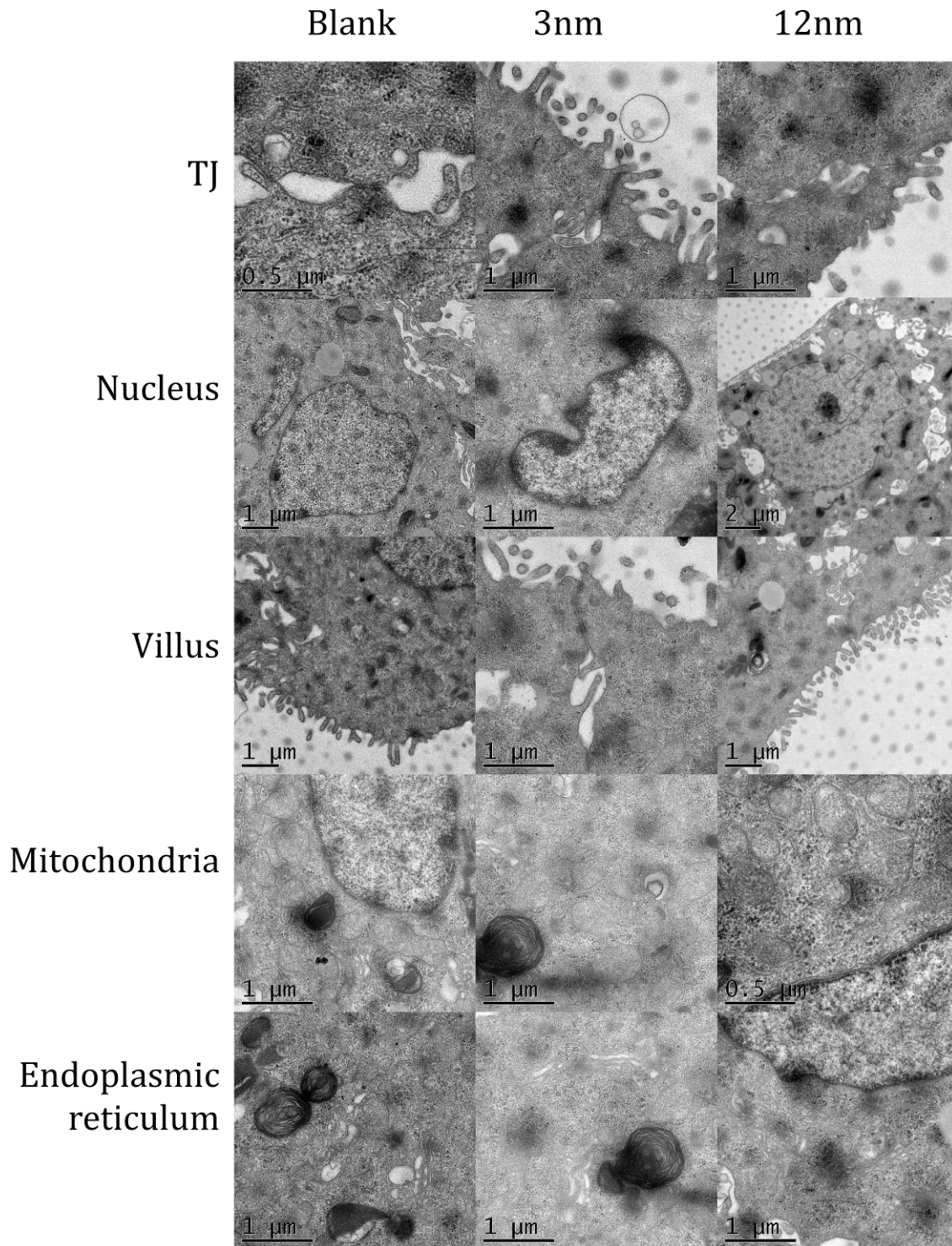


Fig.S2 Comparison of ultrastructural morphology between MDCK cells of treated and no treated with GQDs. The concentrations of GQDs with two sizes of diameter were 0.28 mg/mL. The incubation time of MDCK cell with GQDs was more than 24 hours.

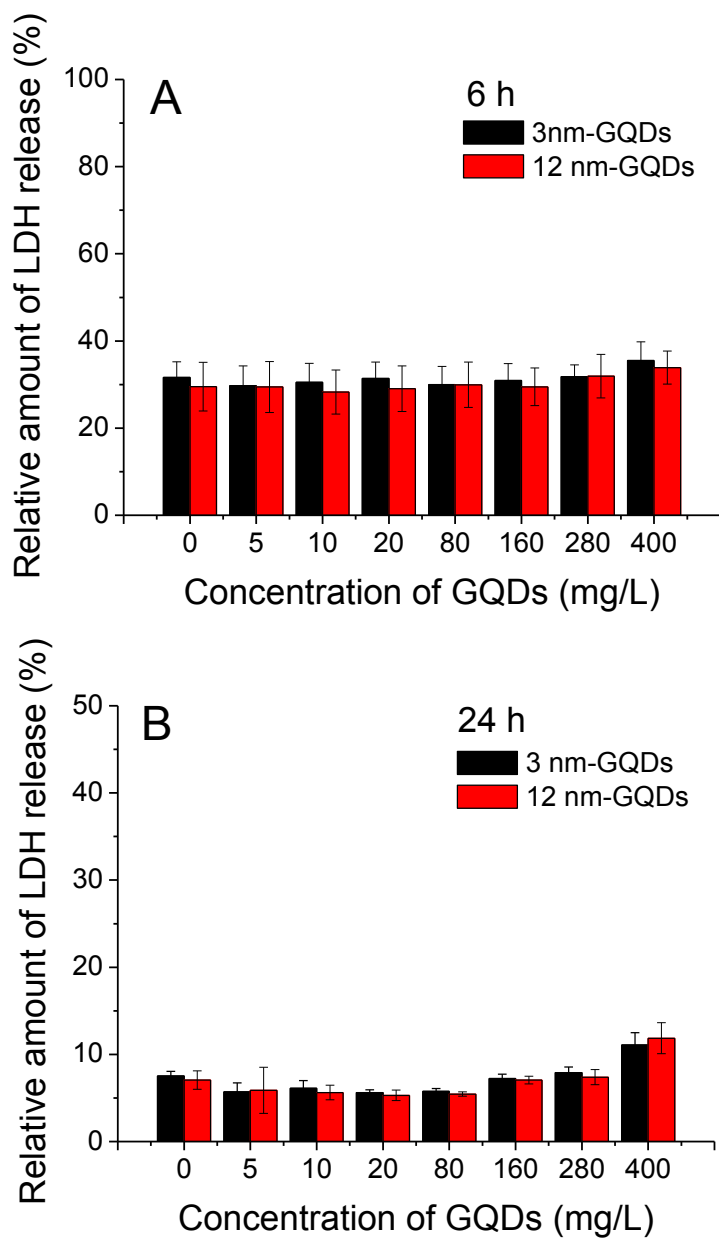


Fig.S3 Release of lactate dehydrogenase (LDH) from MDCK cells upon treatment with different concentrations of GQDs. Data were the mean \pm SD of six replicates.