Electronic Supplementary Information (ESI)

Mitochondria-targetable carbon quantum dots for differentiating cancerous cells from normal cells

Ge Gao,[a] Yao-Wen Jiang,[a] Jingjing Yang[a] and Fu-Gen Wu*[a,b]

[a]*State Key Laboratory of Bioelectronics, School of Biological Science and Medical Engineering, Southeast University, 2 Sipailou Road, Nanjing 210096, P. R. China. E-mail: wufg@seu.edu.cn*

[b]*Key Laboratory of Developmental Genes and Human Disease of the Ministry of Education of China, Institute of Life Sciences, Southeast University, 2 Sipailou Road, Nanjing 210096, P. R. China. E-mail: wufg@seu.edu.cn*

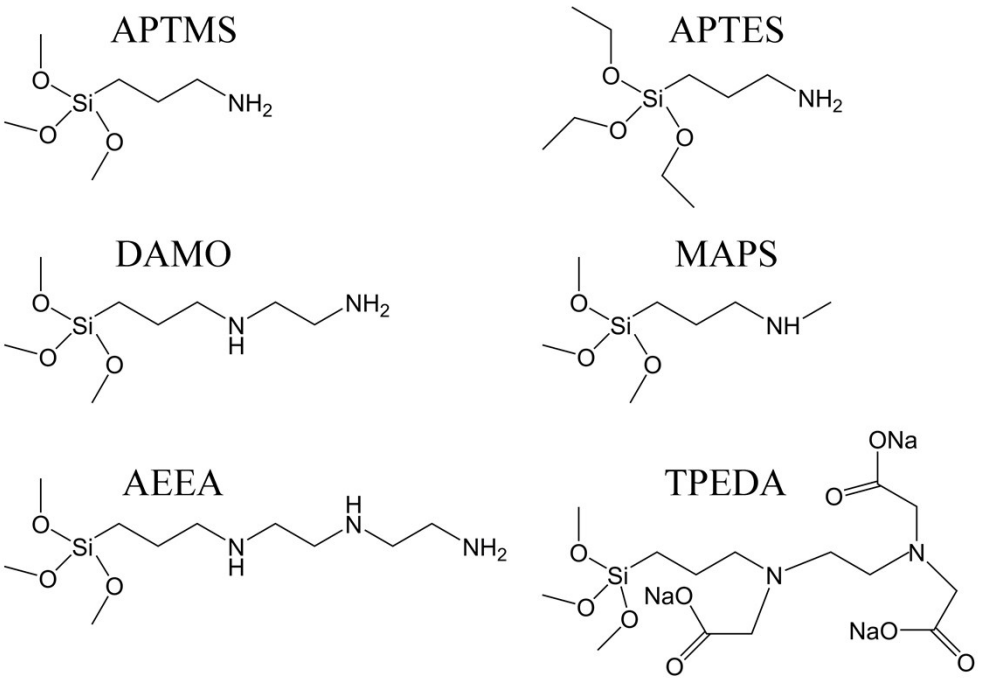

Fig. S1 The chemical structures of different organosilane molecules (APTMS, DAMO, AEEA, APTES, MAPS and TPEDA).

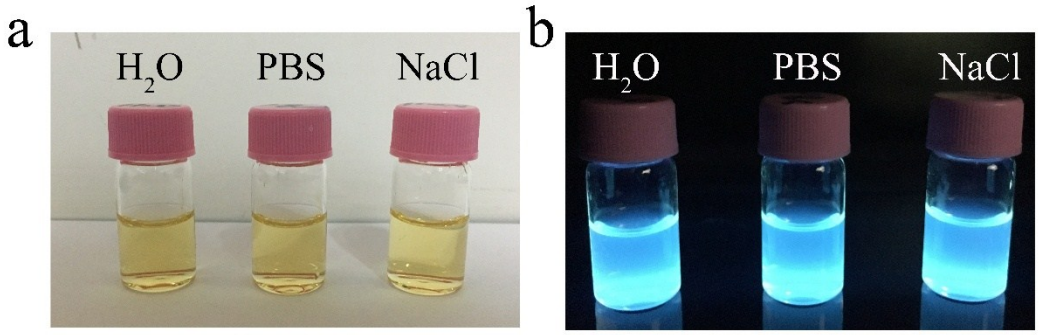

Fig. S2 Photographs of APTMS CDs (1 mg/mL) dispersed in water, PBS or 0.9% NaCl solution pictured under (a) daylight and (b) UV light (302 nm) after storage for 3 months.

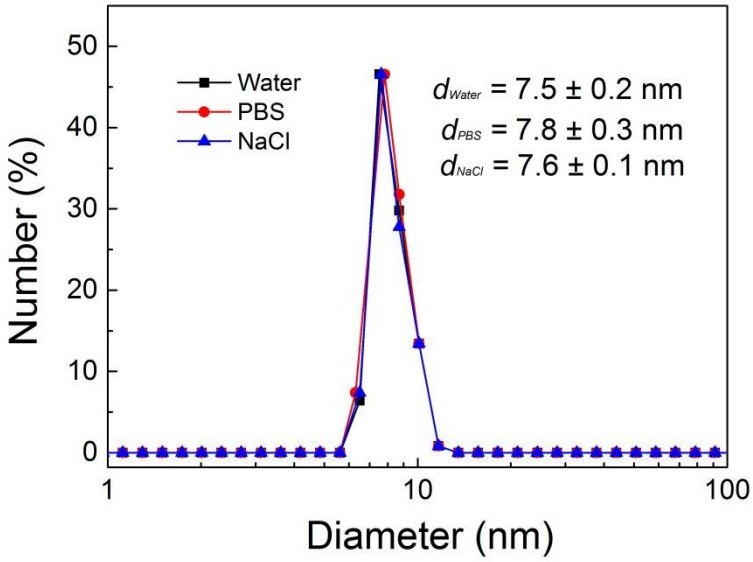

Fig. S3 Dynamic light scattering (DLS) results of APTMS CDs in water, PBS or 0.9% NaCl solution, respectively.

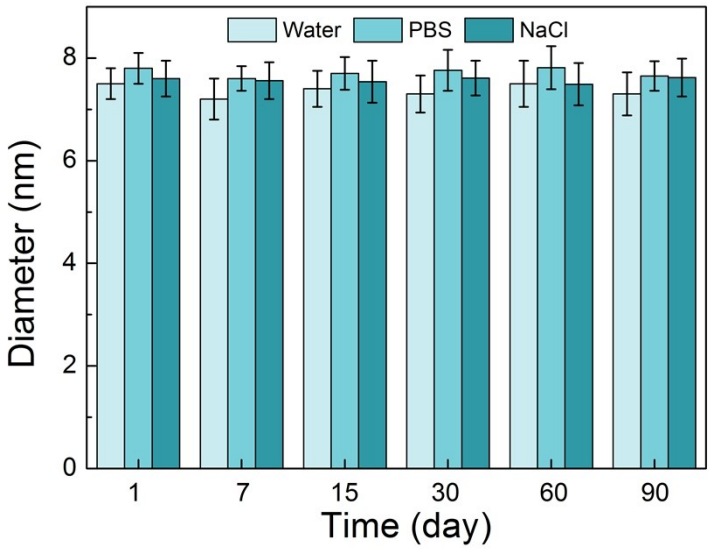

Fig. S4 Hydrodynamic diameters of APTMS CDs in three different aqueous media (H_2O, PBS or 0.9% NaCl) after storage for different time periods.

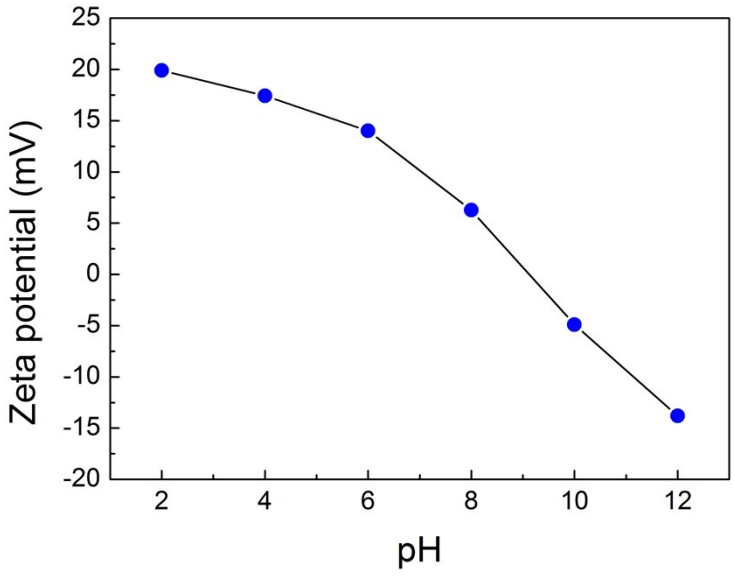

Fig. S5 Variation in the zeta potential of APTMS CDs as a function of solution pH.

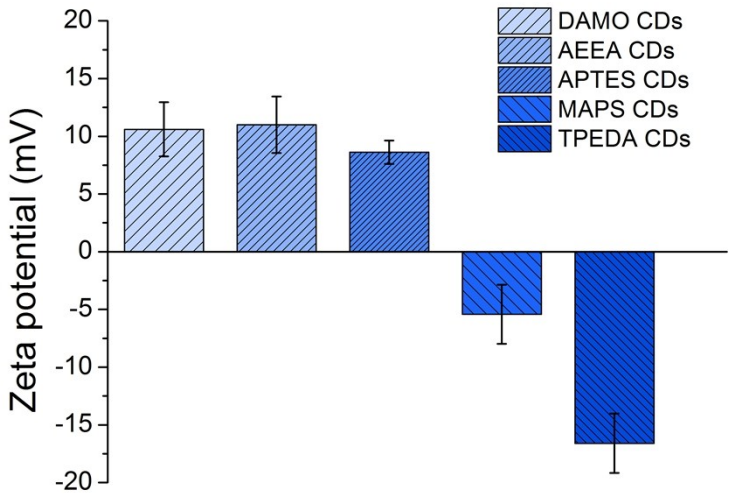

Fig. S6 Zeta potentials of DAMO, AEEA, APTES, MAPS and TPEDA CDs (30 μg/mL) in aqueous solutions.

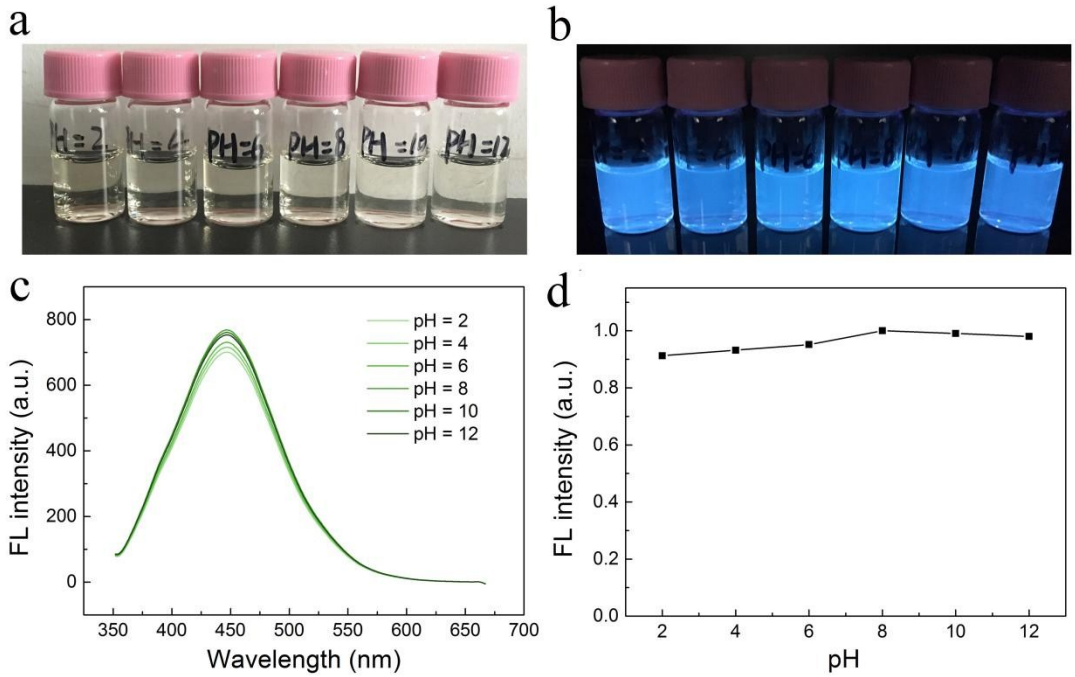

Fig. S7 Photographs of APTMS CDs (30 μg/mL) in solutions with different pH values pictured under (a) daylight and (b) UV light (302 nm). (c) Fluorescence spectra (*Ex*: 348 nm) and (d) the corresponding maximum fluorescence intensities of APTMS CDs in solutions with different pH values.

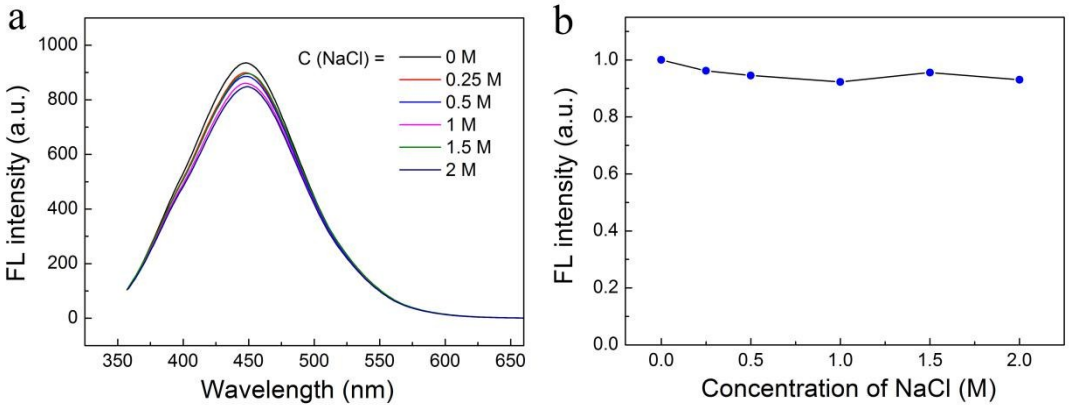

Fig. S8 Effect of ionic strength on the fluorescence intensity of APTMS CDs. (a) Fluorescence spectra (*Ex*: 348 nm) and (b) the corresponding maximum fluorescence intensities of APTMS CDs in different concentrations of NaCl solutions.

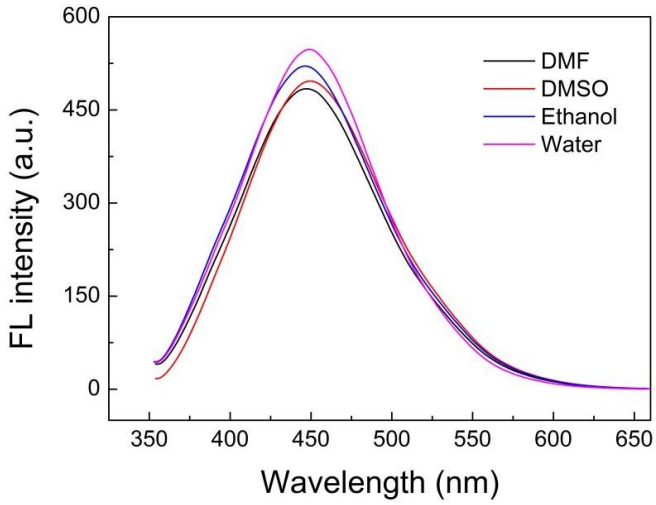

Fig. S9 Fluorescence spectra of APTMS CDs (30 μg/mL) in different solvents as indicated (*Ex*: 348 nm).

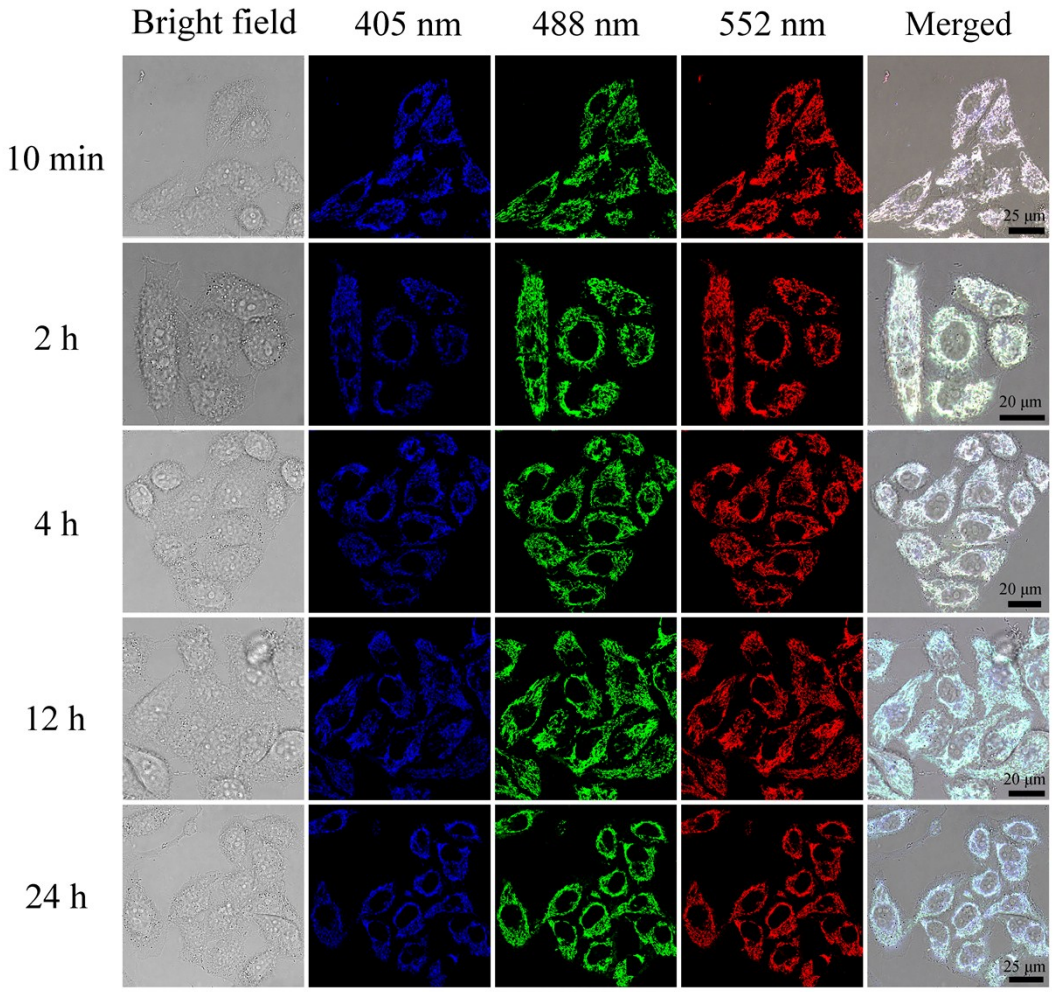

Fig. S10 CLSM images of HeLa cells incubated with 30 μg/mL APTMS CDs for different time periods.

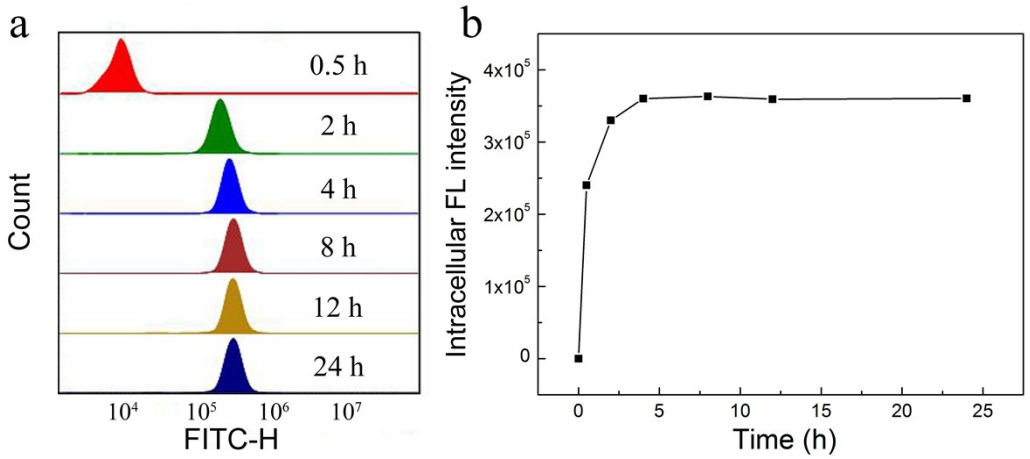

Fig. S11 (a) Flow cytometric analysis of the cellular endocytosis of APTMS CDs at different time points. (b) Corrresponding statistics of intracellular fluorescence signals.

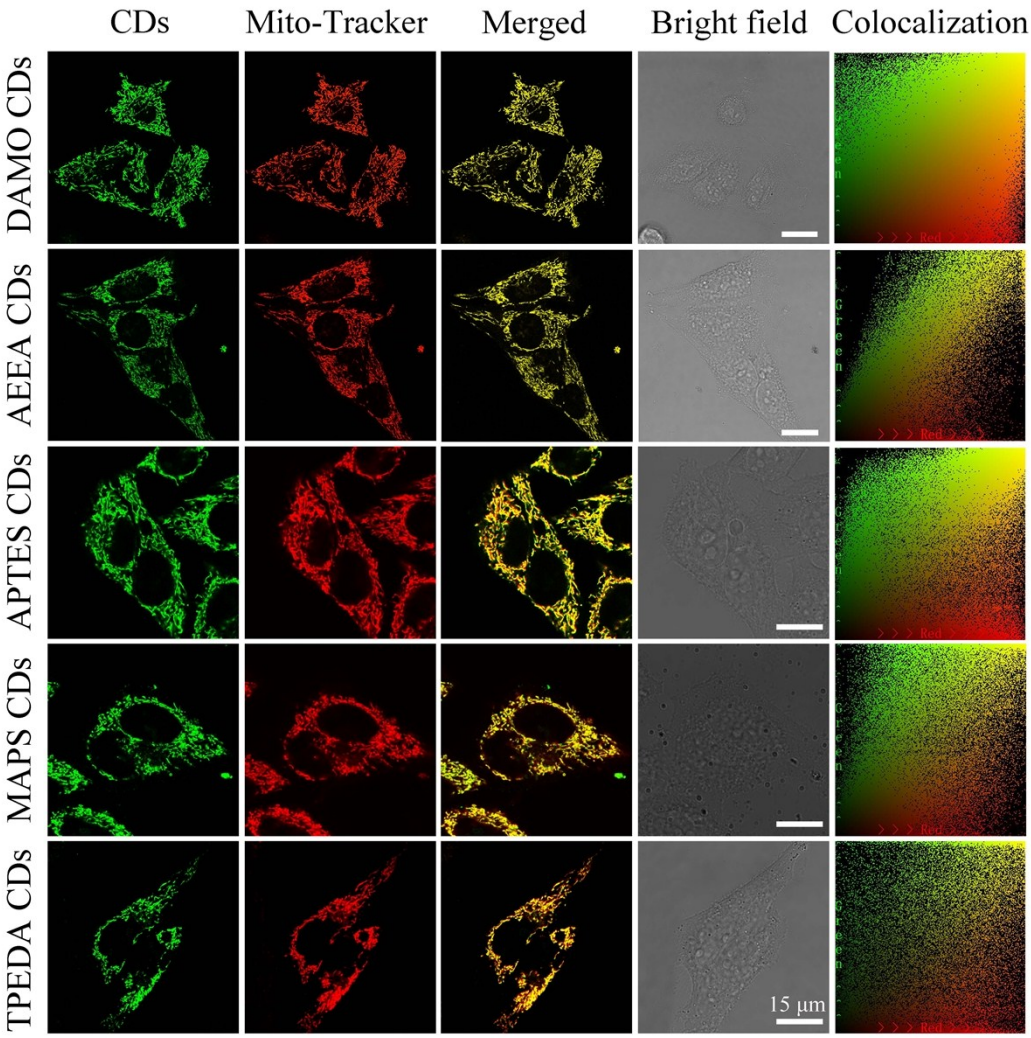

Fig. S12 CLSM images of HeLa cells co-stained with Mito-Tracker and one of the following CDs: DAMO, AEEA, APTES, MAPS and TPEDA CDs.

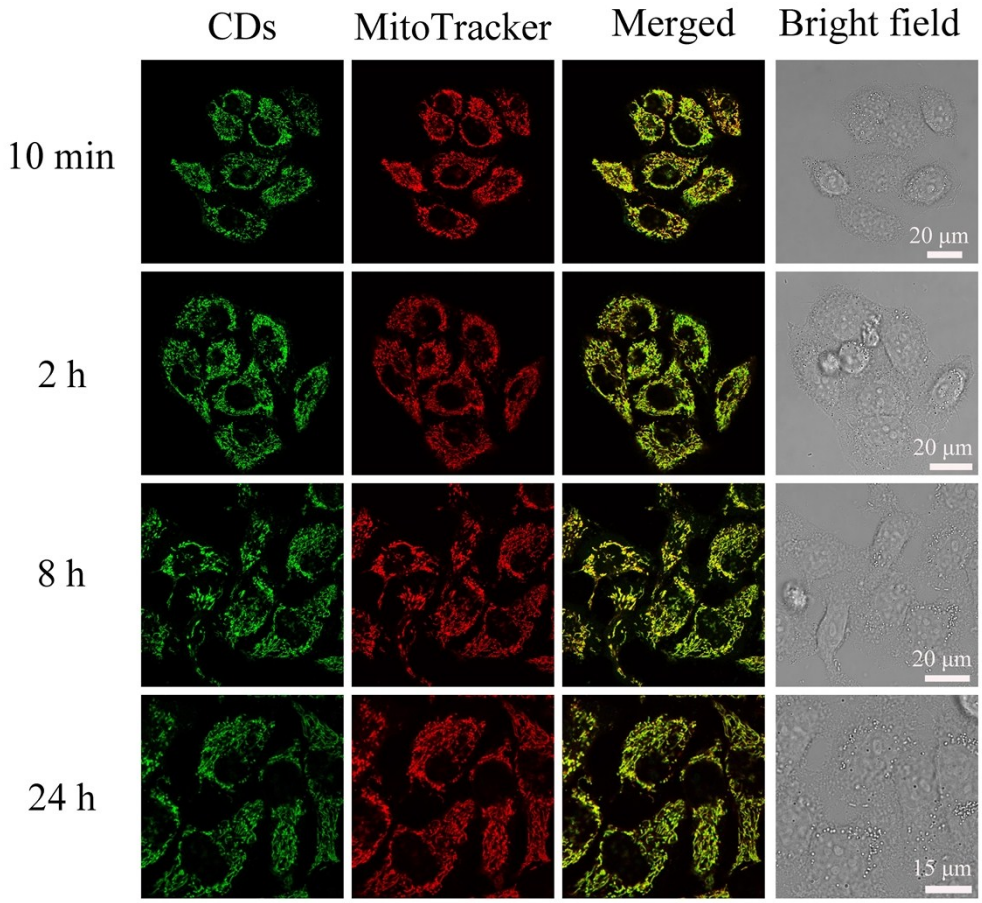

Fig. S13 CLSM images of HeLa cells co-incubated with APTMS CDs and Mito-Tracker for different time periods.

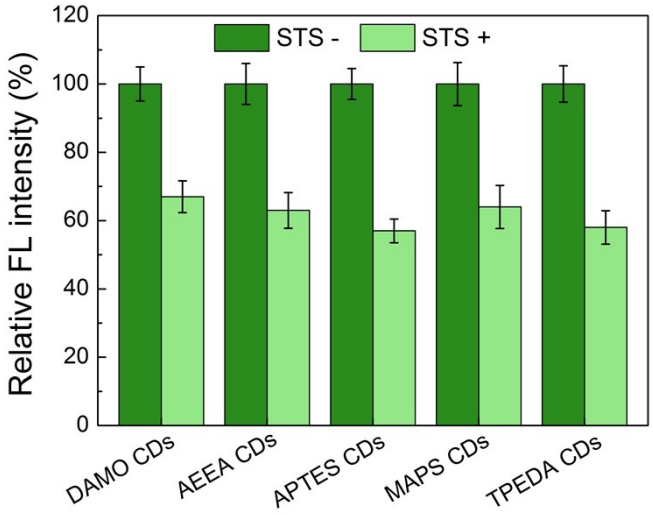

Fig. S14 Flow cytometric analysis of HeLa cells incubated with different CDs (DAMO, AEEA, APTES, MAPS or TPEDA CDs) without the STS treatment (STS –) or with the STS treatment (STS +) for 2 h.

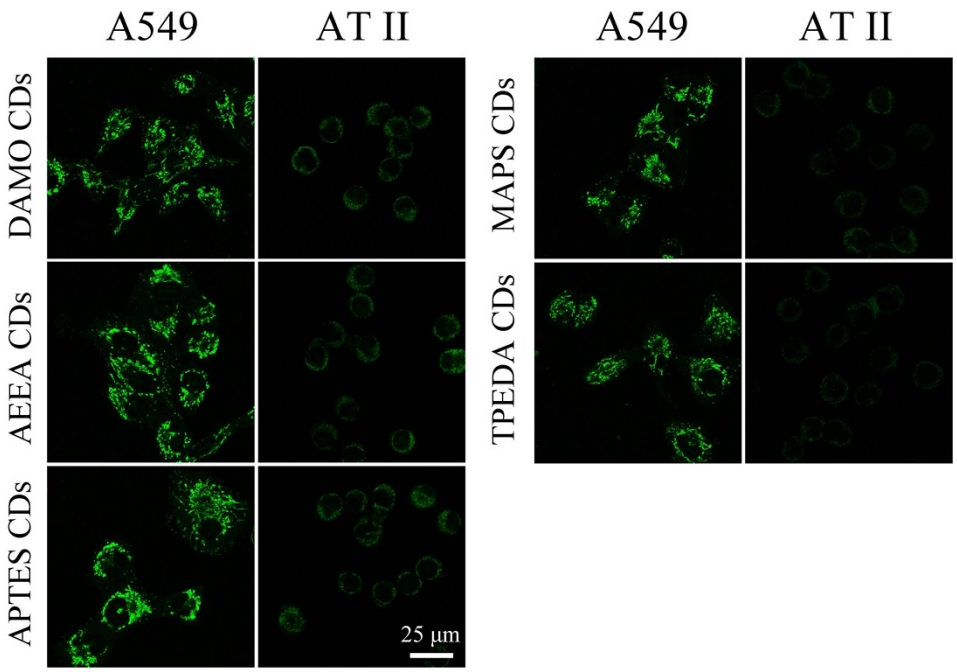

Fig. S15 CLSM images of A549 and AT II cells treated with various CDs (DAMO, AEEA, APTES, MAPS or TPEDA CDs).

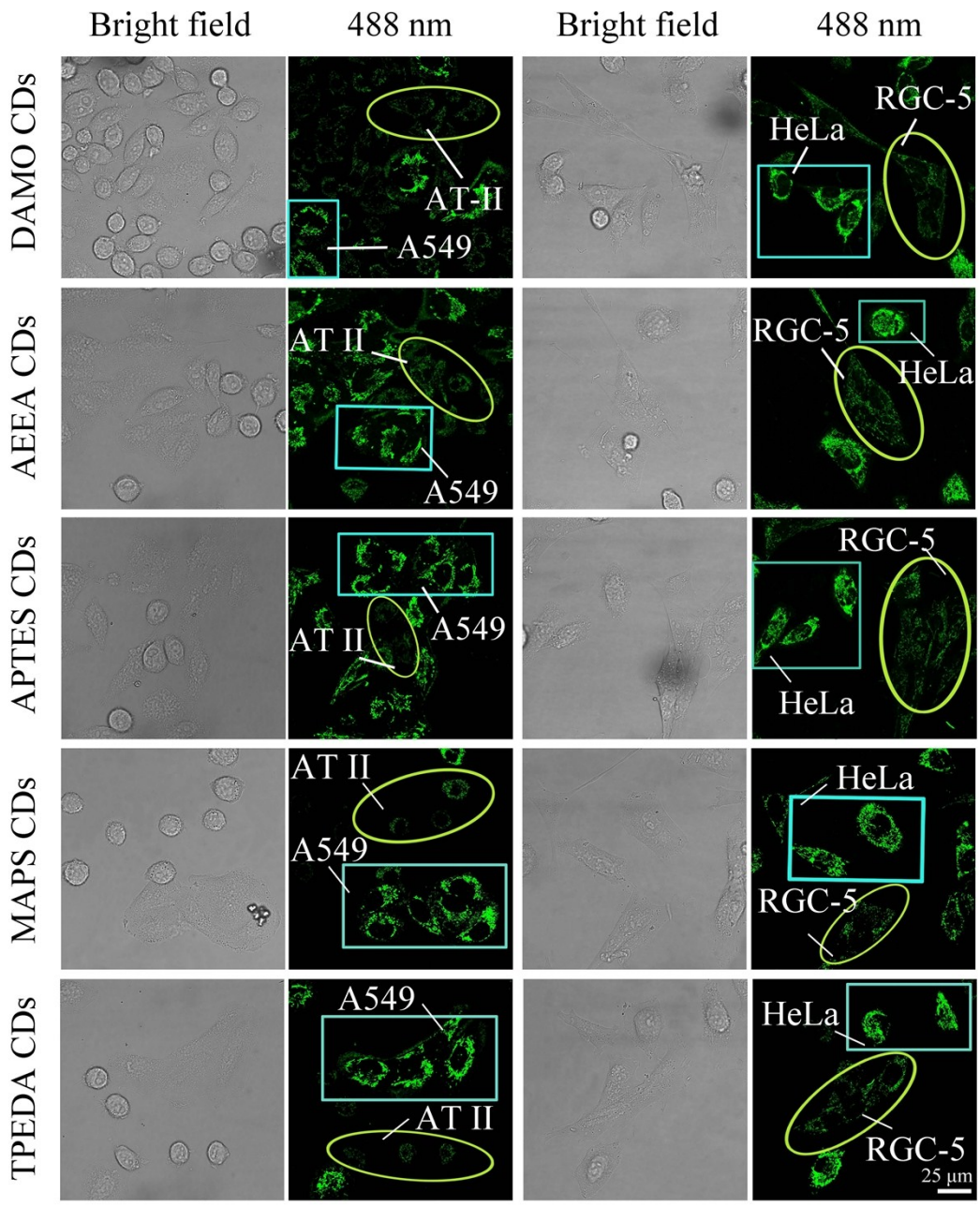

Fig. S16 CLSM images of co-cultured cancerous cells (A549 and HeLa) and normal cells (AT II and RGC-5) with different combinations after treating with DAMO, AEEA, APTES, MAPS or TPEDA CDs.