Electronic Supplementary Material (ESI) for Nanoscale.

Distinct autophagy-inducing abilities of similar-sized nanoparticles in cell culture and live *C. elegans*

Qin Wang[a,b], Yanfeng Zhou[b,c], Rong Fu[a], Yi Zhu[a], Bin Song[b], Yiling Zhong[b], Sicong Wu[b], Yu Shi[b], Yanyan Wu[b], Yuanyuan Su[b], Huimin Zhang*[a] , Yao He*[b]

[a]Jiangsu Key Laboratory of Infection and Immunity, Institutes of Biology and Medical Sciences (IBMS), Soochow University, Suzhou, Jiangsu 215123, China.

[b]Jiangsu Key Laboratory for Carbon-Based Functional Materials and Devices, Institute of Functional Nano and Soft Materials (FUNSOM), Collaborative Innovation Center of Suzhou Nano Science and Technology, Soochow University, Suzhou, Jiangsu 215123, China.

[c]School of Public Health, Shanghai Jiao Tong University School of Medicine, Shanghai 200025, China.

* Corresponding authors. Telephone: 86-512-6588 0946 Fax: 86-512-6588 2846

E-mails: zhanghuimin@suda.edu.cn (H. Zhang), yaohe@suda.edu.cn (Y. He)

Additional data:

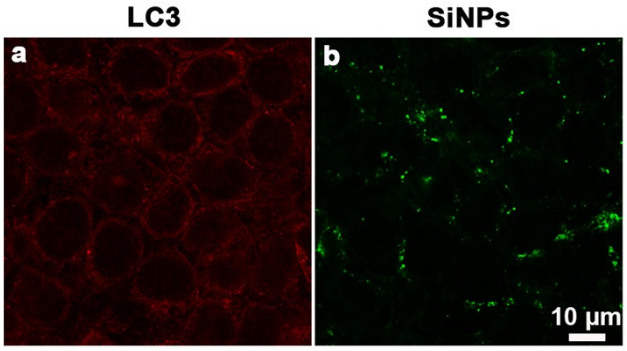

Fig. S1 Representative confocal images of autophagosomes labeled by anti-LC3 immunostaining (a) and the fluorescence of SiNPs (b) in SiNP-treated cells corresponding to **Fig. 2**.

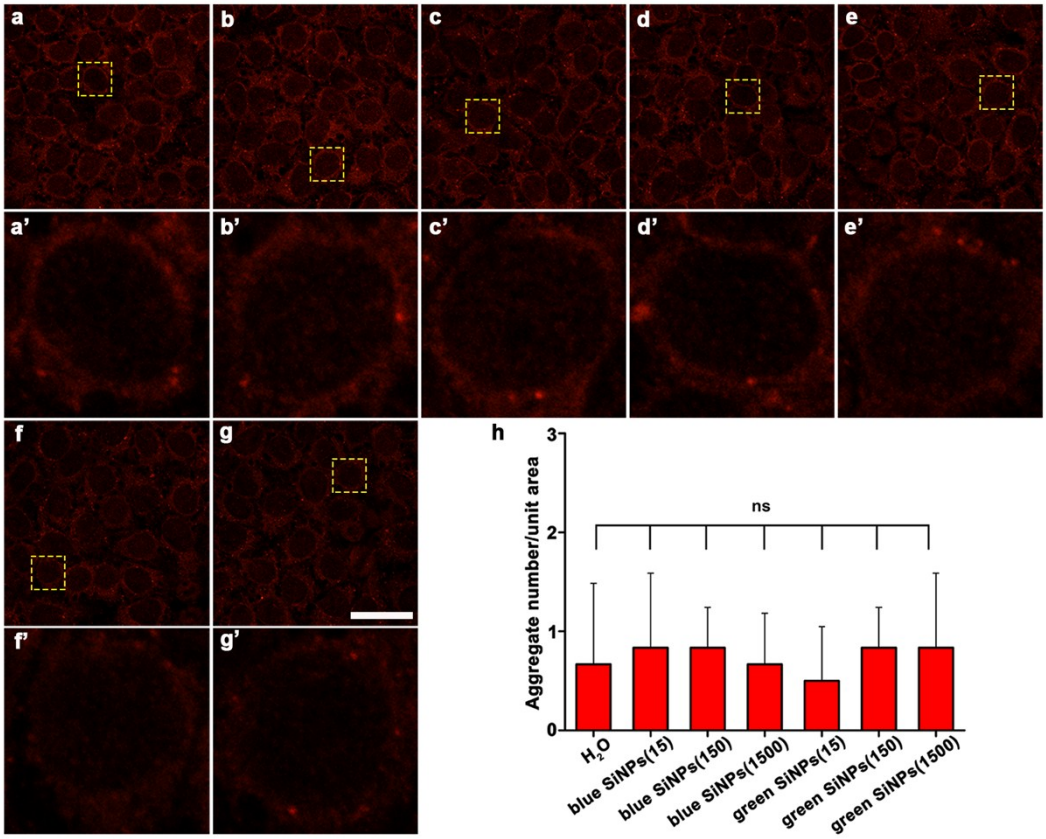

Fig. S2 Autophagosomes formation in HeLa cells after exposure to different doses of blue- or green-emitting SiNPs. (a-g) Representative confocal images of autophagosomes labeled by anti-LC3 immunostaining in cells treated with de-ionized H_2O (a), blue-emitting SiNPs with 15 μg/mL (b), 150 μg/mL (c), 1500 μg/mL (d), or green-emitting SiNPs with 15 μg/mL (e), 150 μg/mL (f), 1500 μg/mL (g) for 24 h. (a'-g') are enlarged views of the boxed areas in (a-g), respectively. (h) Quantitative analysis of the number of LC3 puncta corresponding to the experimental groups in (a-g). The scale bar represents 25 μm. N ≥ 4 for each data set. Error bars, ± SEM; ns, $p > 0.05$.

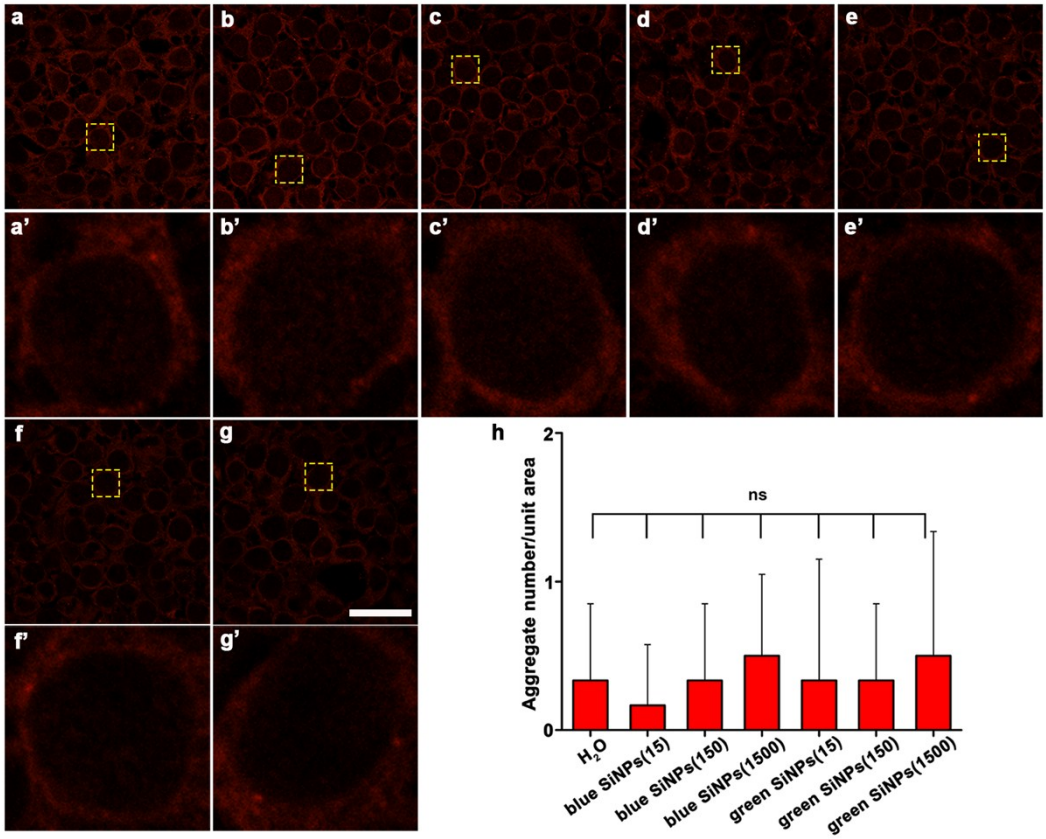

Fig. S3 Autophagosomes formation in HEK293T cells after exposure to different doses of blue- or green-emitting SiNPs. (a-g) Representative confocal images of autophagosomes labeled by anti-LC3 immunostaining in cells treated with de-ionized H_2O (a), blue-emitting SiNPs with 15 μg/mL (b), 150 μg/mL (c), 1500 μg/mL (d), or green-emitting SiNPs with 15 μg/mL (e), 150 μg/mL (f), 1500 μg/mL (g) for 24 h. (a'-g') are enlarged views of the boxed areas in (a-g), respectively. (h) Quantitative analysis of the number of LC3 puncta corresponding to the experimental groups in (a-g). The scale bar represents 25 μm. N ≥ 4 for each data set. Error bars, ± SEM; ns, $p > 0.05$.

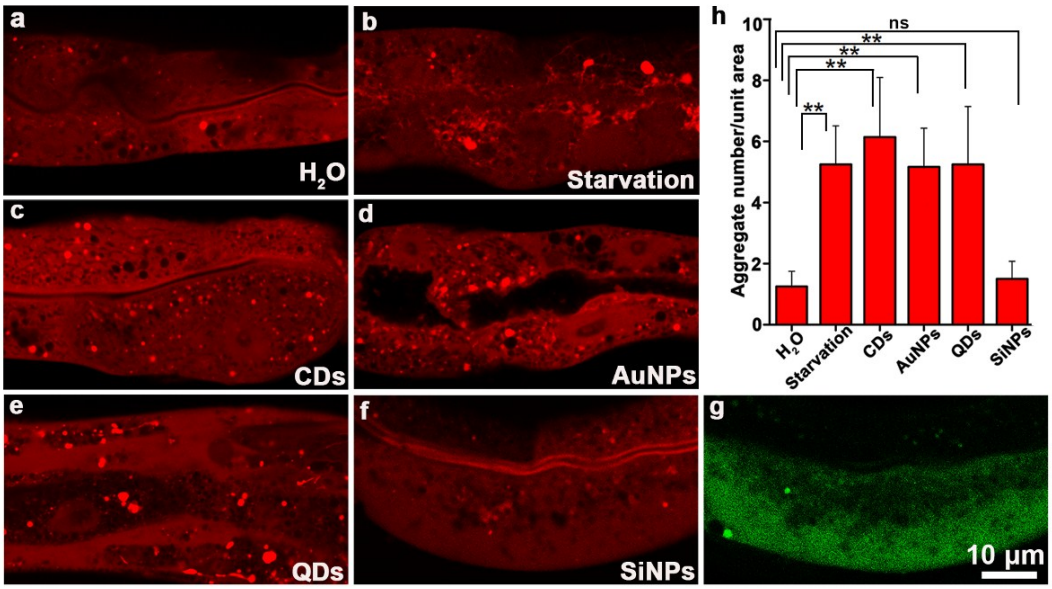

Fig. S4 Autophagosomes formation in *C. elegans* after CDs, AuNPs, QDs, or SiNPs microinjection. (a-f) Representative confocal images of autophagosome marked by LGG-1::mCherry in worms after 6-h injection of H_2O (a, negative control), starvation (b, positive control), CDs (c), AuNPs (d), QDs (e) or SiNPs (f) into *C. elegans* intestinal cells. (g) The fluorescence of SiNPs in the same region corresponding to (f). (h) Quantitative analysis of the number of mCherry::LGG-1 aggregates corresponding to the experimental groups in (a-f). N ≥ 4 for each data set. Error bars, ± SEM; $^{**}p < 0.01$; $^{*}p < 0.05$; ns, $p > 0.05$.

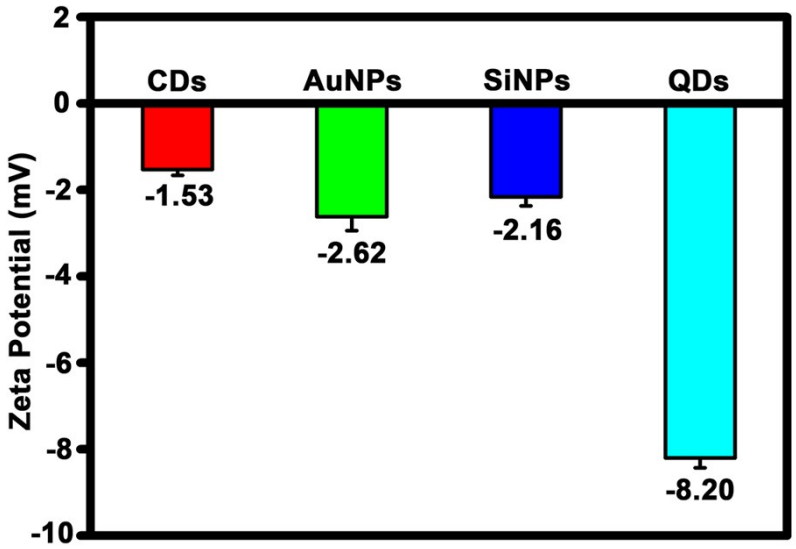

Fig. S5 Zeta potentials of CDs, AuNPs, SiNPs and QDs. Three experimental repeats for each data set. Error bars, ± SEM.