Electronic Supplementary Material (ESI) for Toxicology Research

Supporting information

Surfactant-dispersed nanodiamond: biocompatibility evaluation and drug delivery applications

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Results and discussion

The stability of ND nanoparticles dispersed by different surfactants is shown in Figure. S1, all the ND suspensions showed excellent stability after they were dispersed in water for at least 24 h. In particular, the anionic surfactants (SDS and SDBS) dispersed ND nanoparticles showed enhanced dispersibility in H_2O as compared with bare ND nanoparticles. The enhancement of dispersibility of ND nanoparticles in water was further confirmed by size distribution measurement. As shown in Table 1, the size distribution of bare ND nanoparticles in H_2O is 344.5 ± 19.5 nm. Its size was reduced to 88.3 ± 1.2 and 72.0 ± 0.9 nm in the present of SDS (Figure. S1B, No. 4) and SDBS (Figure S1B, No. 5), respectively. However, other surfactants showed no significant effects on the size distribution of ND nanoparticles based on size distribution measurement.

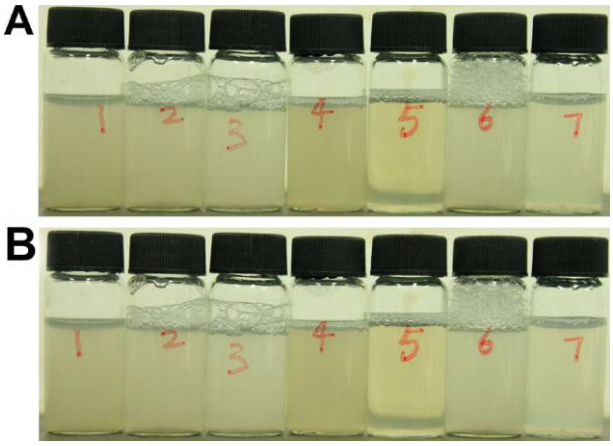

Fig. S1 Colloidal stability of ND nanoparticles in H_2O (A) just upon mix and after (B) 24 h. (1) bare ND, (2) ND-F127, (3) ND-Brij35, (4) ND-SDS, (5) ND-SDBS, (6) ND-CTAB, (7) ND-LEC.

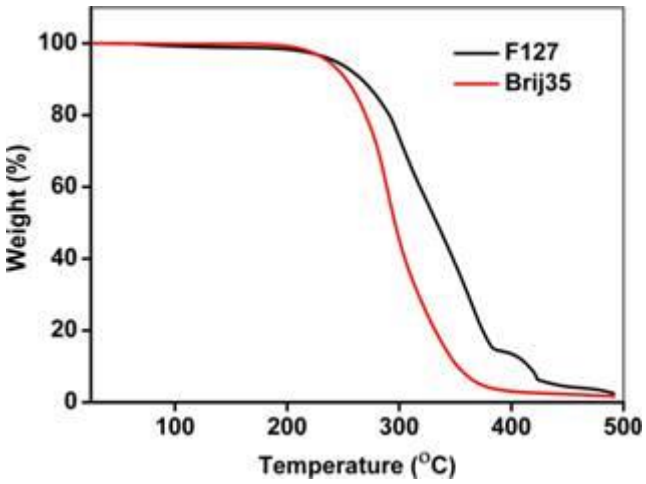

Fig. S2 TGA cruves of surfactants F127 and Brij35. It can be seen that significant weight loss of surfactants iniated at about 200 °C. And almost all the surfactants were decomposited when temperature reached to 400 °C.

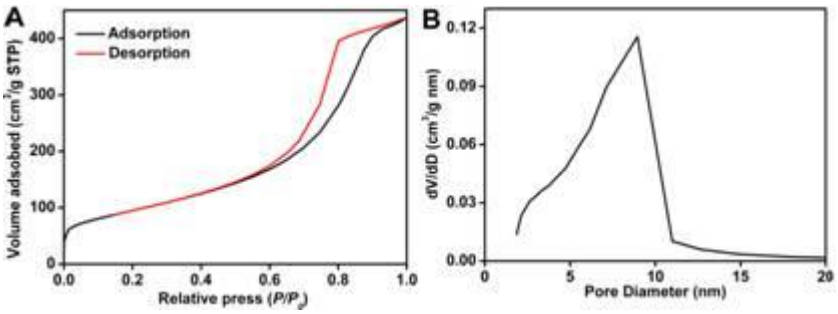

Fig. S3 (A) N_2 adsorption-desorption isotherms for the ND nanoparticles. The N_2 volume is at standard temperature and pressure (STP) and p/p_0 is the partial pressure of N_2 in equilibrium with the sample at 77 k. (B) BJH pore size distributions of ND nanoparticles. dV/dD is the derivative of the normalized N_2 pore volume desorbed with respect to the diameter of the adsorbent.

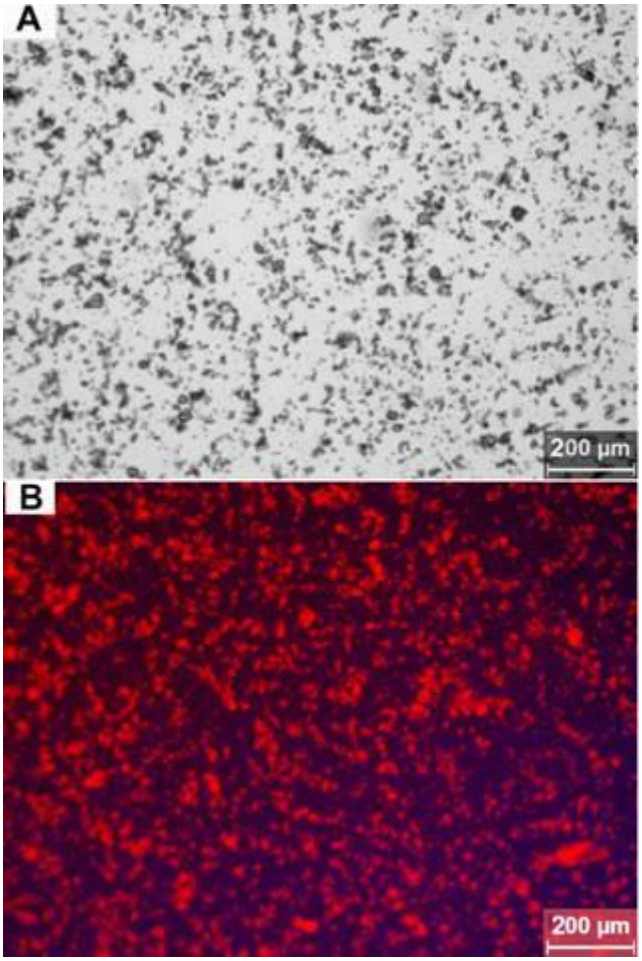

Fig. S4 Optical microscopy images of ND-LEC-DOX nanoparticles, (A) bright field, (B) fluorescent images exicited by green optical filter, magnification = 100 fold.

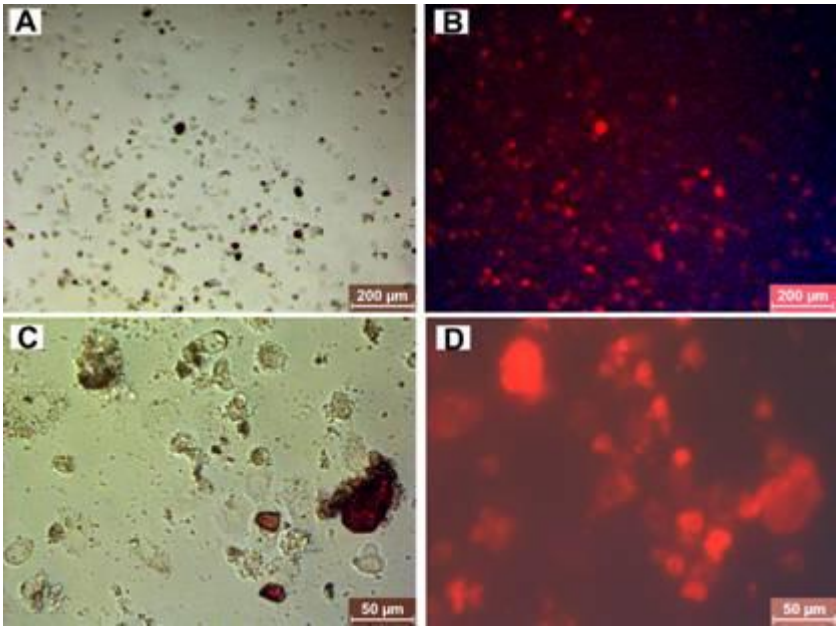

Fig. S5 Optical images of A549 cells incubated with 20 µg mL^{-1} of ND-LEC-DOX for 24 h. (A, B)

magnification = 100 fold, (C, D) magnification = 400 fold.