Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B.

Supporting Information

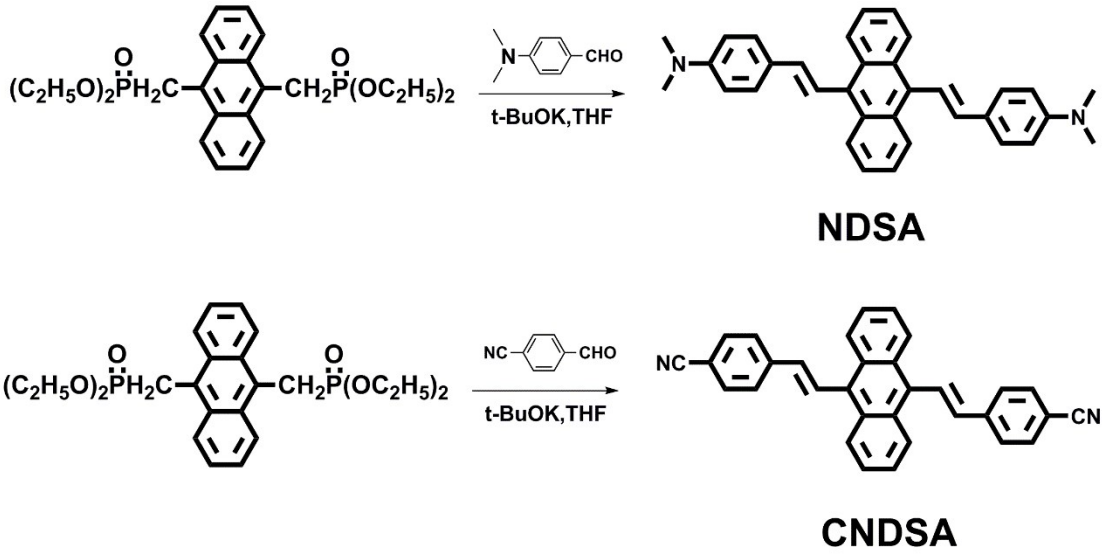
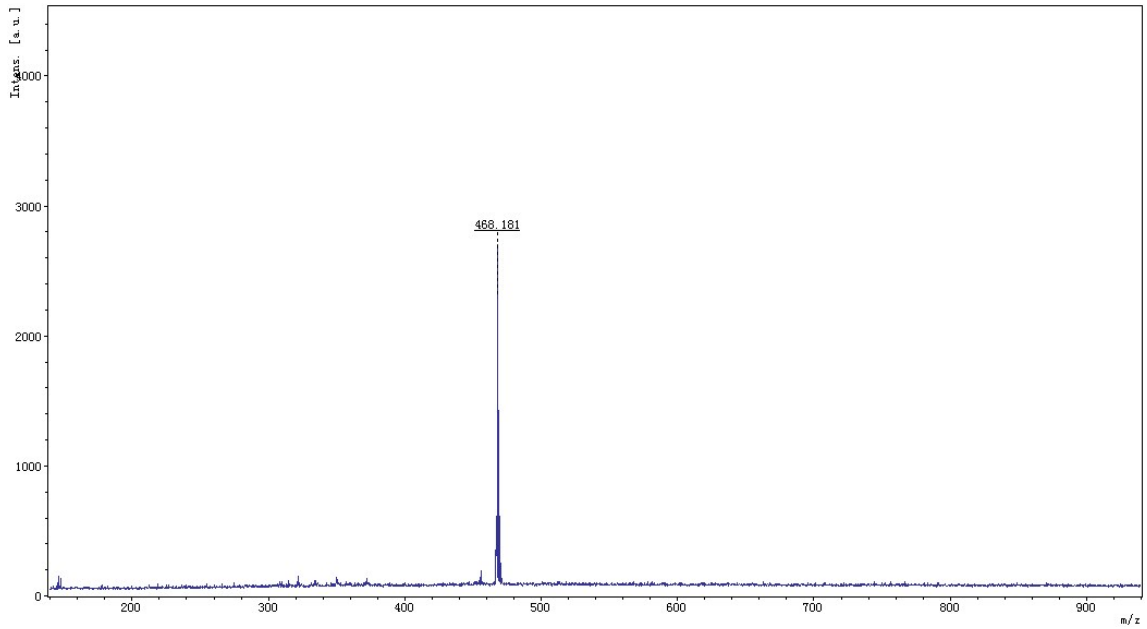


Fig. S1 Synthesis routes of NDSA and CNDSA.

Fig. S2 MALDI-TOF-MS spectrum of NDSA.



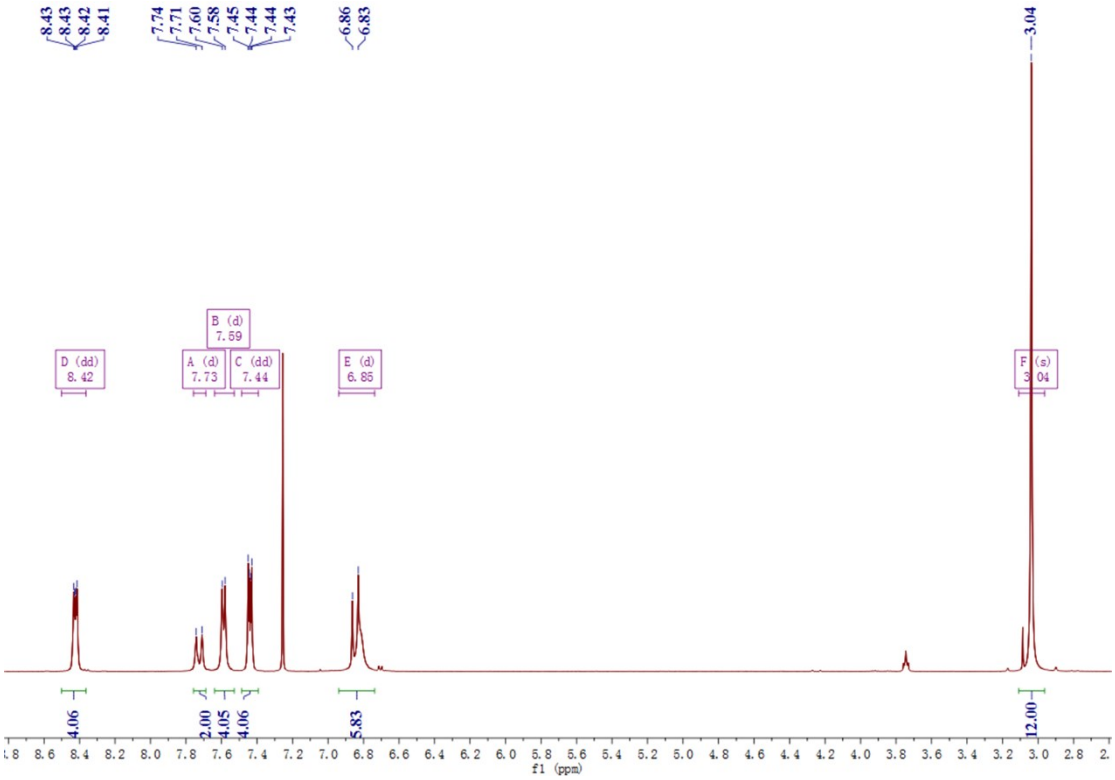
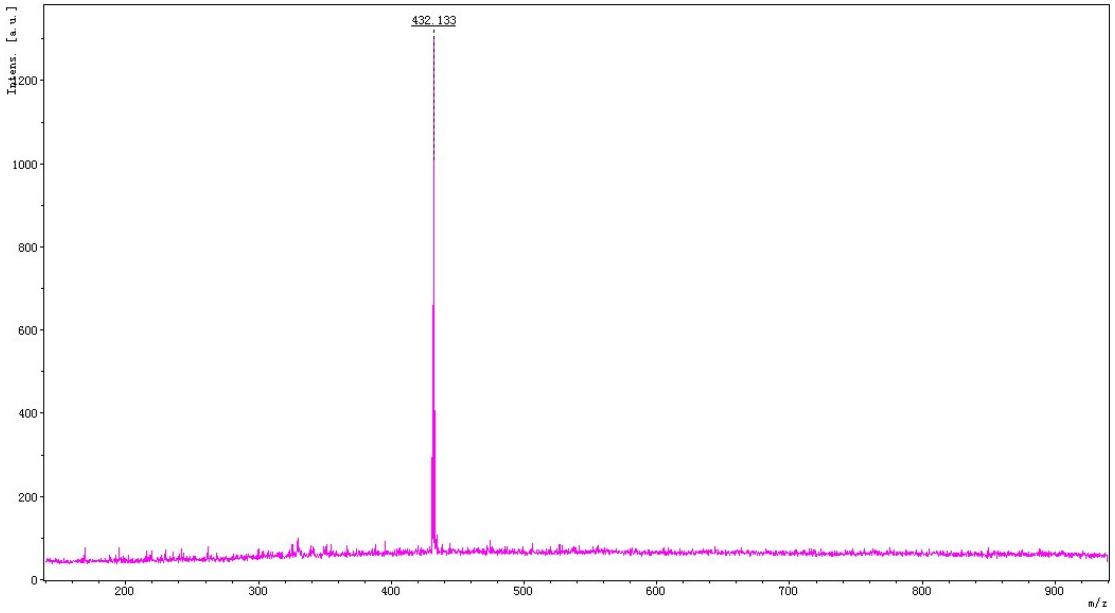


Fig. S3 ^{1}H NMR spectra of NDSA in $CDCl_3$.

Fig. S4 MALDI-TOF-MS spectrum of CNDSA.



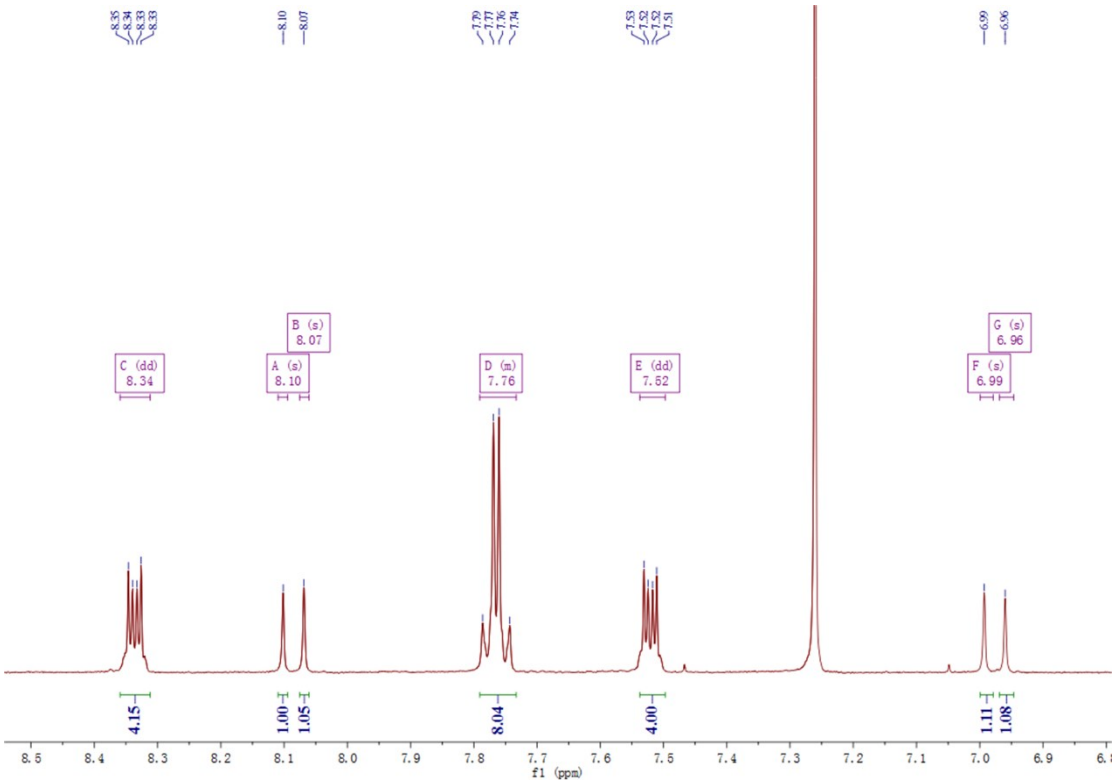


Fig. S5 ^{1}H NMR spectra of CNDSA in $CDCl_3$.

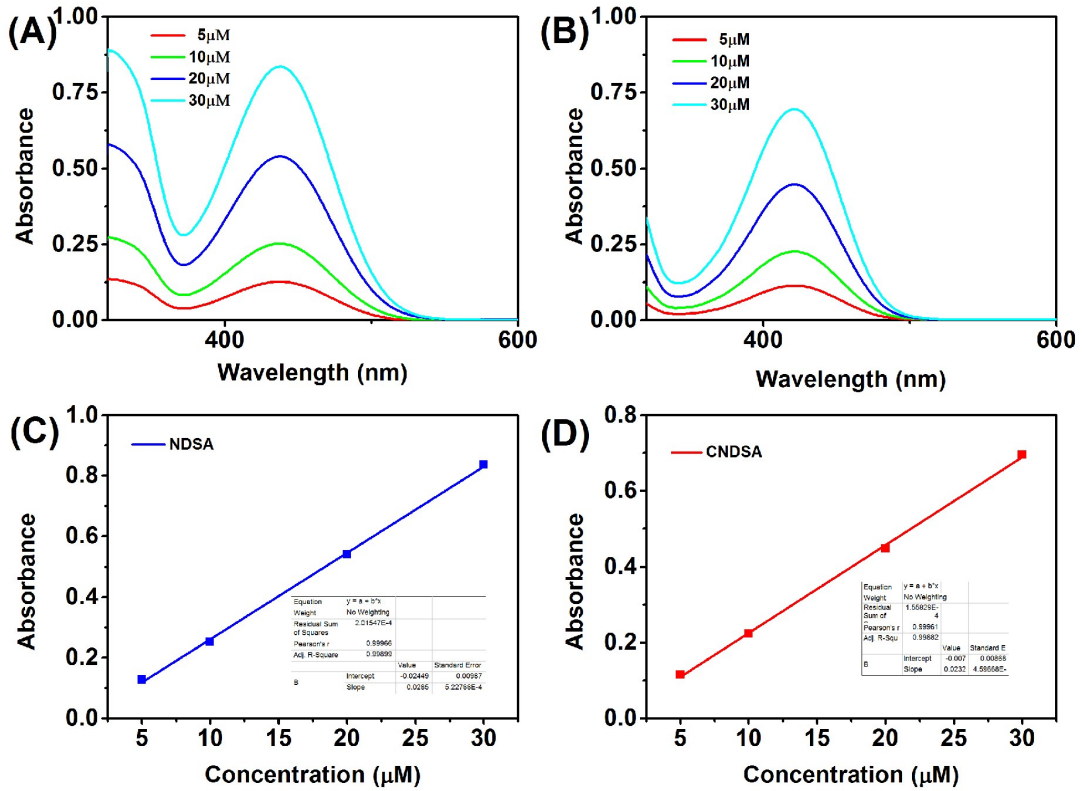


Fig. S6 (a) the absorbance of different concentrations of NDSA in THF/H_2O (4:1, v/v); (b) the absorbance of different concentrations of CNDSA in THF/H_2O (4:1, v/v); (c) the standard calibration curve of NDSA in THF/H_2O=4:1 (v/v); (d) the standard calibration curve of CNDSA in THF/H_2O=4:1 (v/v).

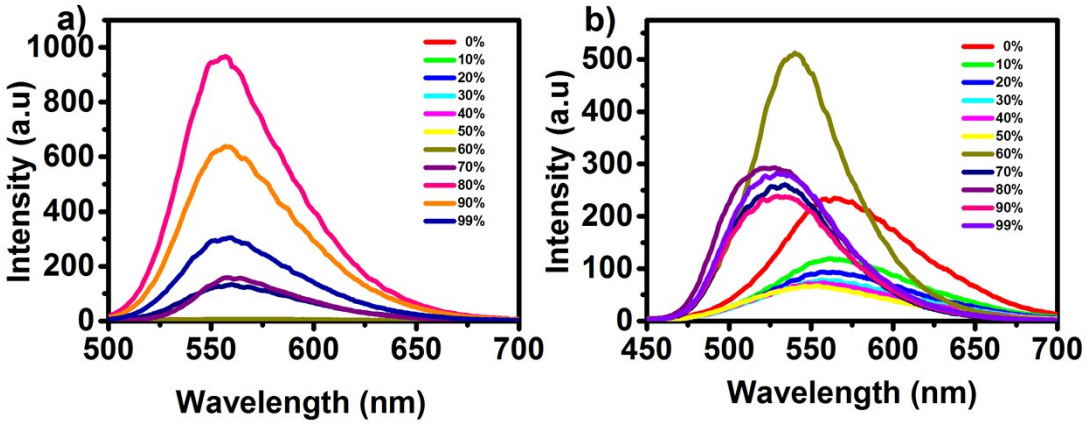


Fig. S7 AIE property of (a) NDSA, (b) CNDSA in THF-H_2O mixtures with different water fractions.

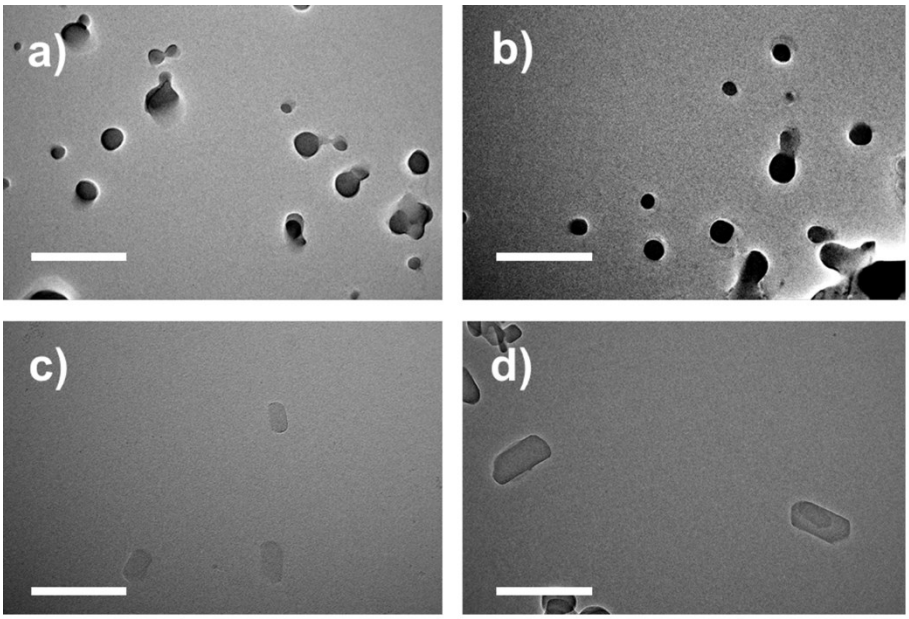


Fig. S8 TEM images of (a) NDSA NDs, (b) CNDSA NDs, (c) NDSA NRs and (d) CNDSA NRs. scale bars, 200 nm.

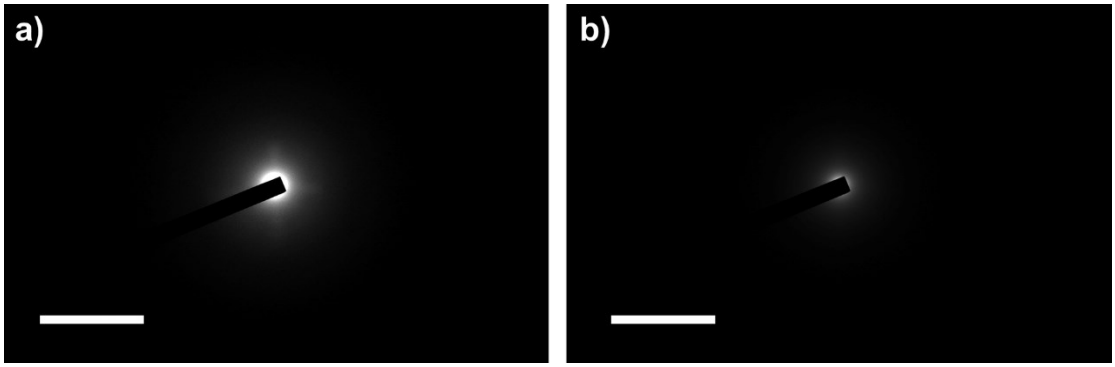


Fig. S9 Selected area electron diffraction (SAED) patterns of (a) NDSA NRs, (b) CNDSA NRs. Scale bars, 51 nm.

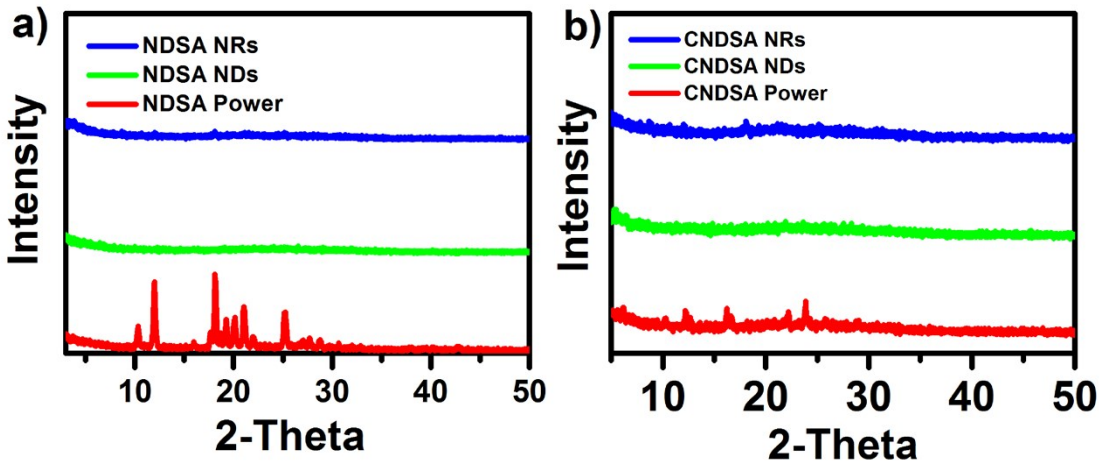


Fig. S10 (a) The powder X-ray diffractogram of the NDSA NRs (blue line), NDSA NDs (green line) and NDSA (red line); (b) The powder X-ray diffractogram of the CNDSA NRs (blue line), CNDSA NDs (green line) and CNDSA (red line).

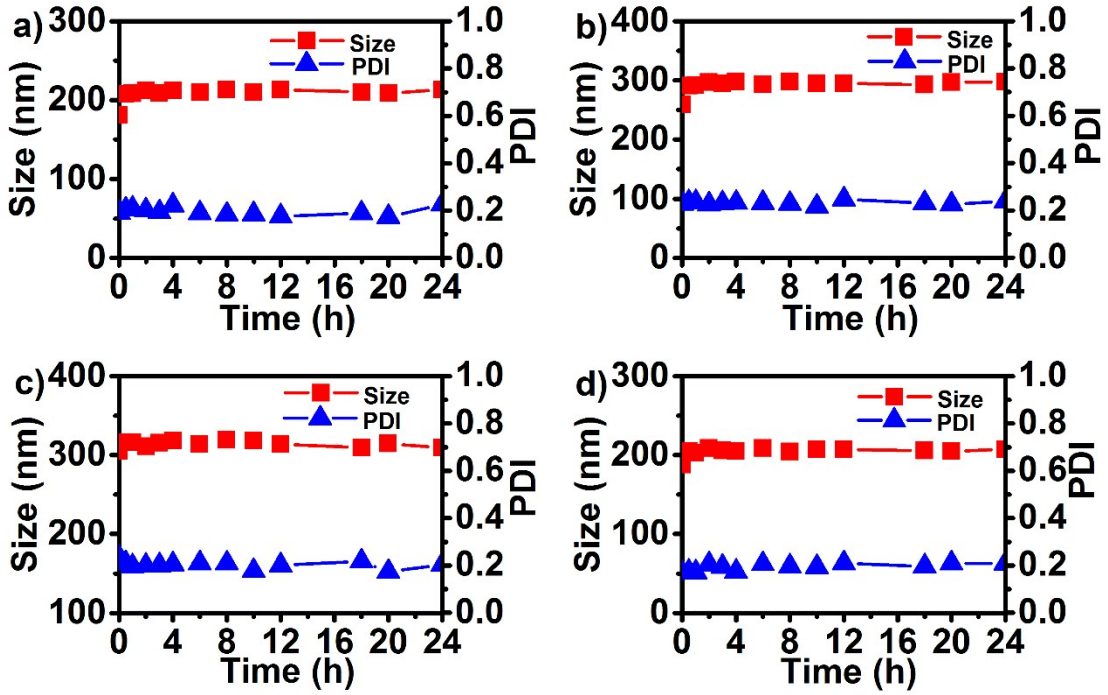


Fig. S11 Changes of the average diameter (a) NDSA NRs, (b) CNDSA NRs, (c) NDSA NDs, and CNDSA NDs in RPMI-1640 with 10% FBS over different time monitored by DLS.

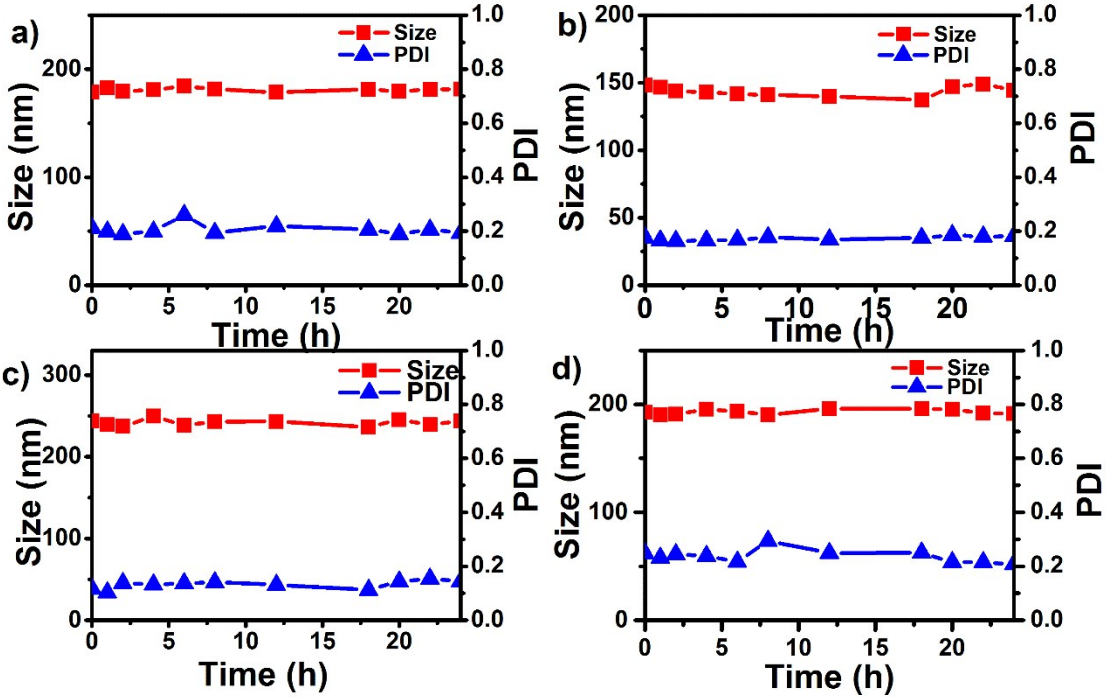


Fig. S12 Changes of the average diameter (a) NDSA NRs, (b) CNDSA NRs, (c) NDSA NDs, and CNDSA NDs in RPMI-1640 without 10% FBS over different time monitored by DLS.

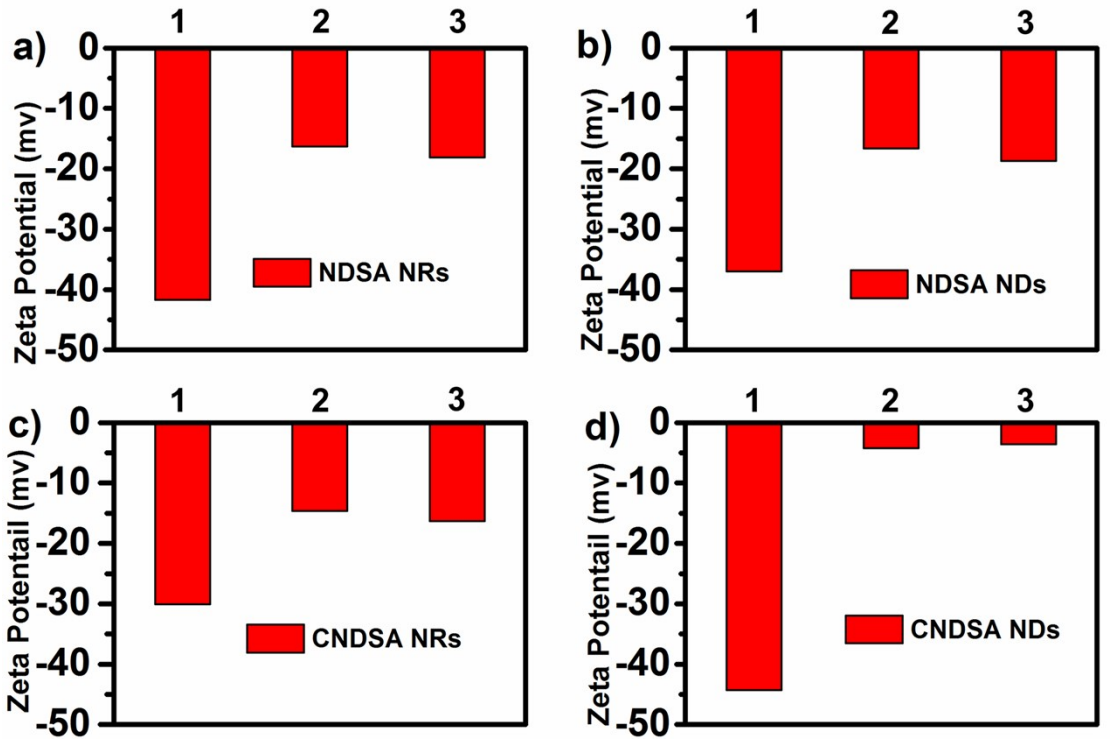


Fig. S13 Zeta potential changes over time of (a) NDSA NRs, (b) NDSA NDs, (c) CNDSA NRs, and (d) CNDSA NDs after being incubated in RPMI-1640 with 10% FBS. 1: zeta potential of nanodots or nanorods without medium; 2: zeta potential of nanodots or nanorods with medium for 30 s; 3: zeta potential of nanodots or nanorods with medium after 24 h.

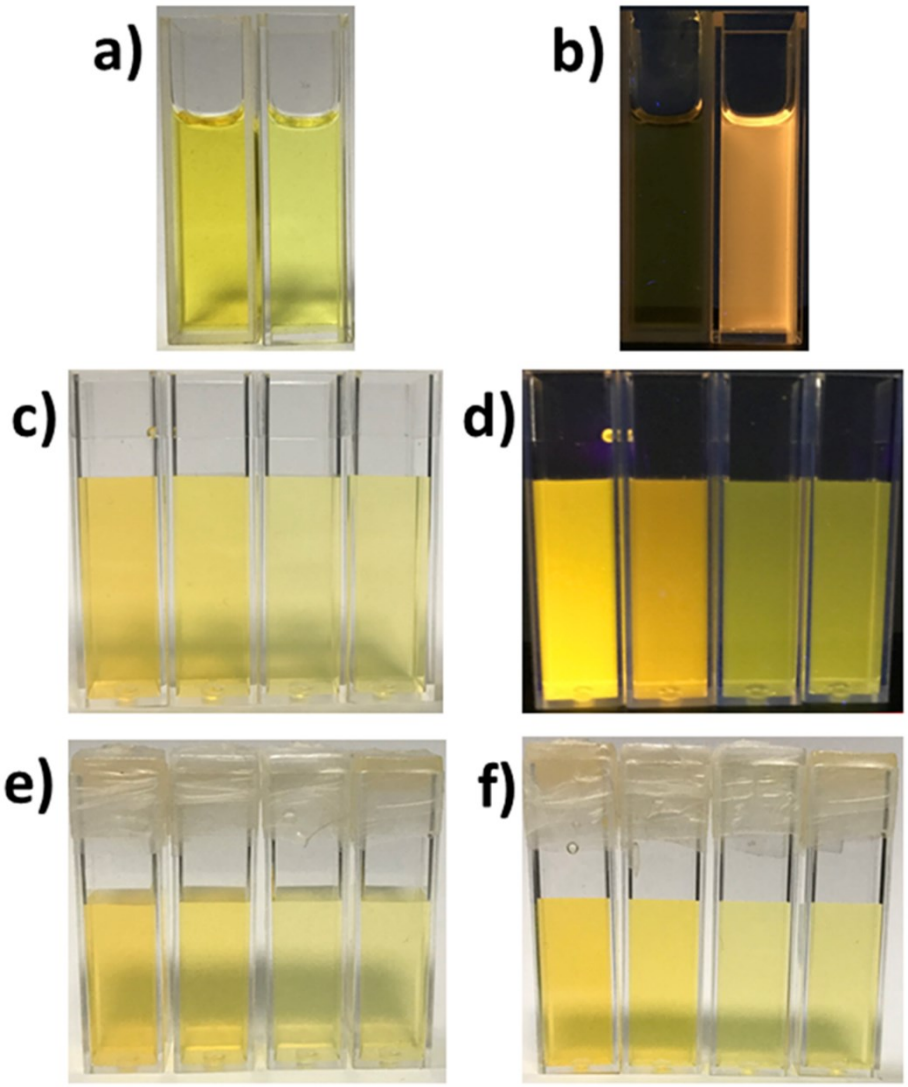


Fig. S14 Photographs of NDSA and CNDSA in THF under (a) room light and (b) UV light (from left to right: NDSA, CNDSA); Photographs of NDSA NRs, NDSA NDs, CNDSA NRs, CNDSA NDs in water (c) room light and (d) UV light; Photographs of NDSA NRs, NDSA NDs, CNDSA NRs, CNDSA NDs in RP-1640 with 10% FBS under room light for (e) 1 min and (f) 24 h (from left to right: NDSA NRs, NDSA NDs, CNDSA NRs, CNDSA NDs).

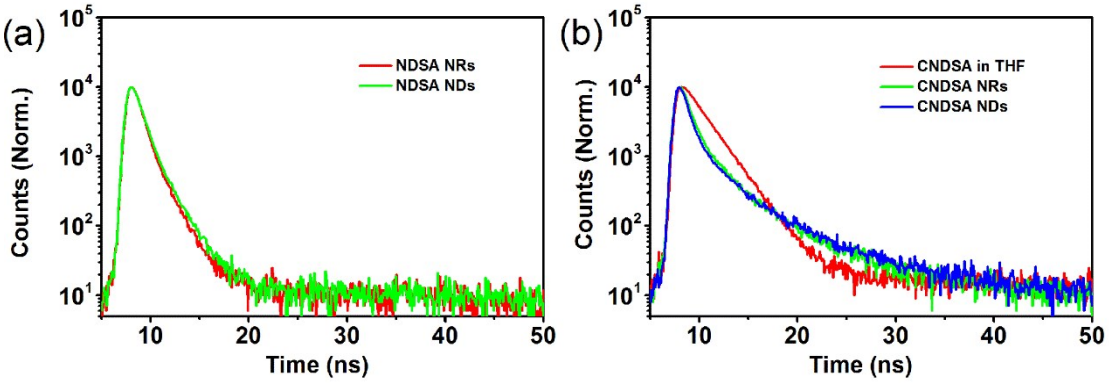


Fig. S15 Time-resolved decay profiles of the (a) NDSA NRs, NDSA NDs in water and (b) CNDSA NRs, CNDSA NDs in water and CNDSA in THF.

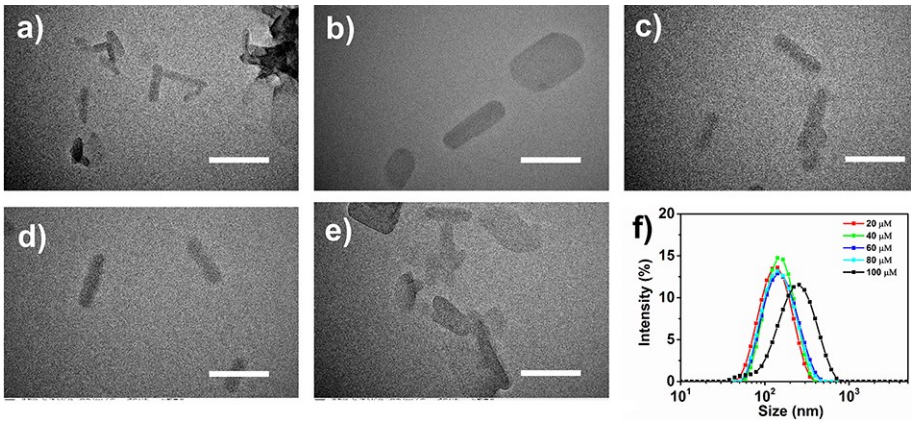


Fig. S16 TEM images of NDSA NRs with different concentrations of NDSA a) 20 μM; b) 40 μM; c) 60 μM; d) 80 μM; e) 100 μM and corresponding size distributions in (f). Scale bars, 200 nm.

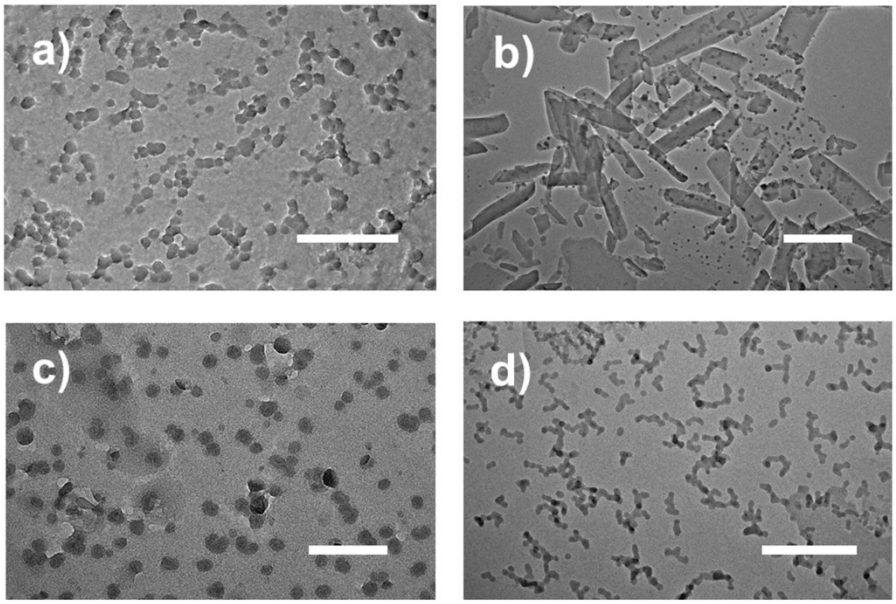


Fig. S17 TEM images of CNDSA particles in THF-H_2O mixtures with water fractions of a) 60%, b) 70%, c) 80%, d) 90%. Scale bars, a) 1 μm; b) 200 nm; c) 1 μm; d) 200 nm.

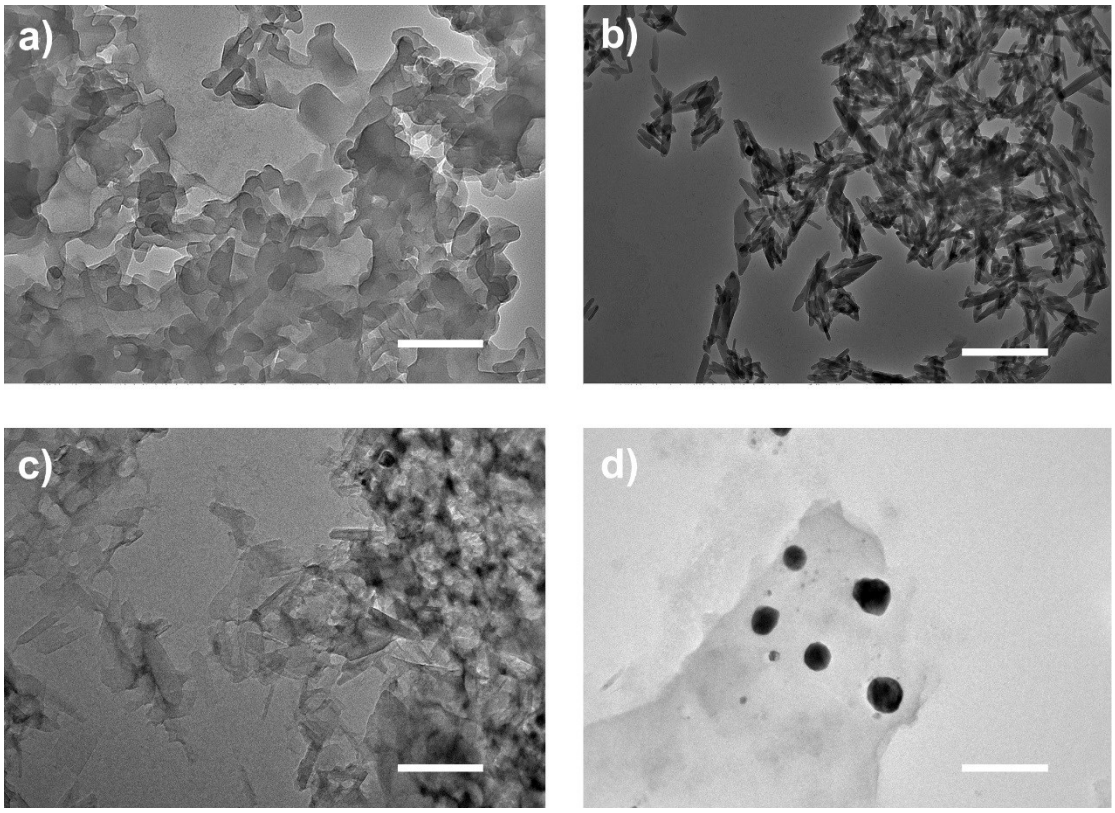


Fig. S18 TEM images of CNDSA particles in THF-H_2O mixtures under 10 min sonication with water fractions of a) 60%, b) 70%, c) 80%, d) 90%. Scale bars, a) 200 nm; b) 1 μm; c) 200 nm; d) 200 nm.

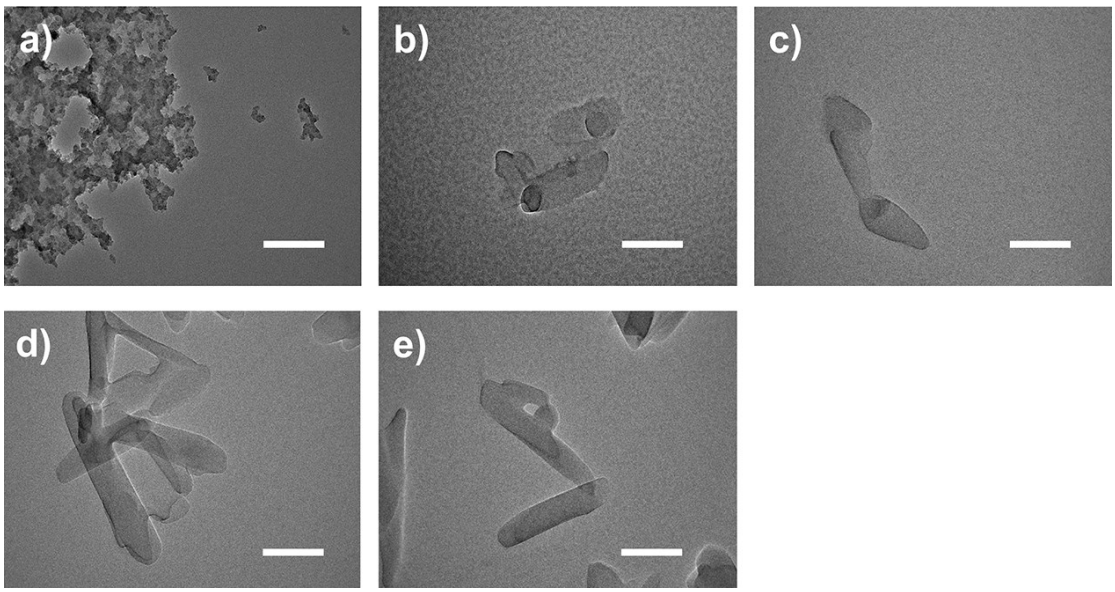


Fig. S19 TEM images of CNDSA nanoparticles during the nanodot-to-nanorod transition with prolonged sonication time a) 30 s; b) 1 min; c) 3 min; d) 5 min; e) 10 min. Scale bars, 200 nm.

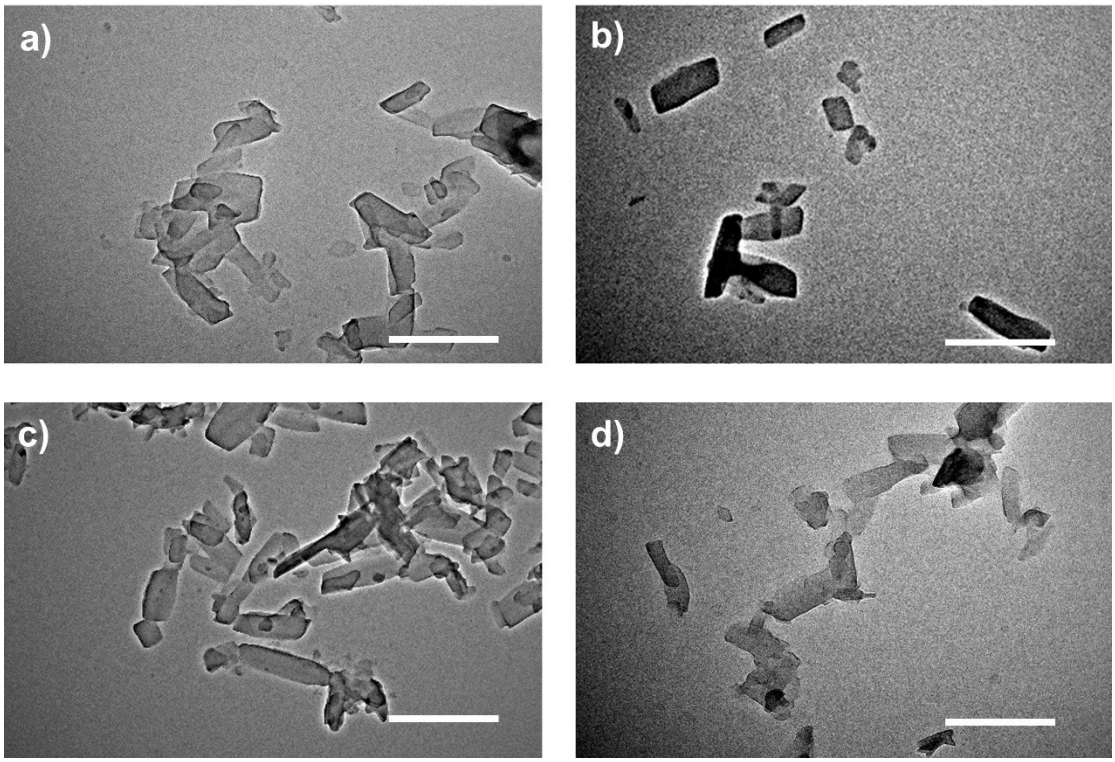


Fig. S20 TEM images of CNDSA NRs with different concentrations of CNDSA a) 60 μM; b) 120 μM; c) 180 μM; d) 240 μM. Scale bars, 1 μm.

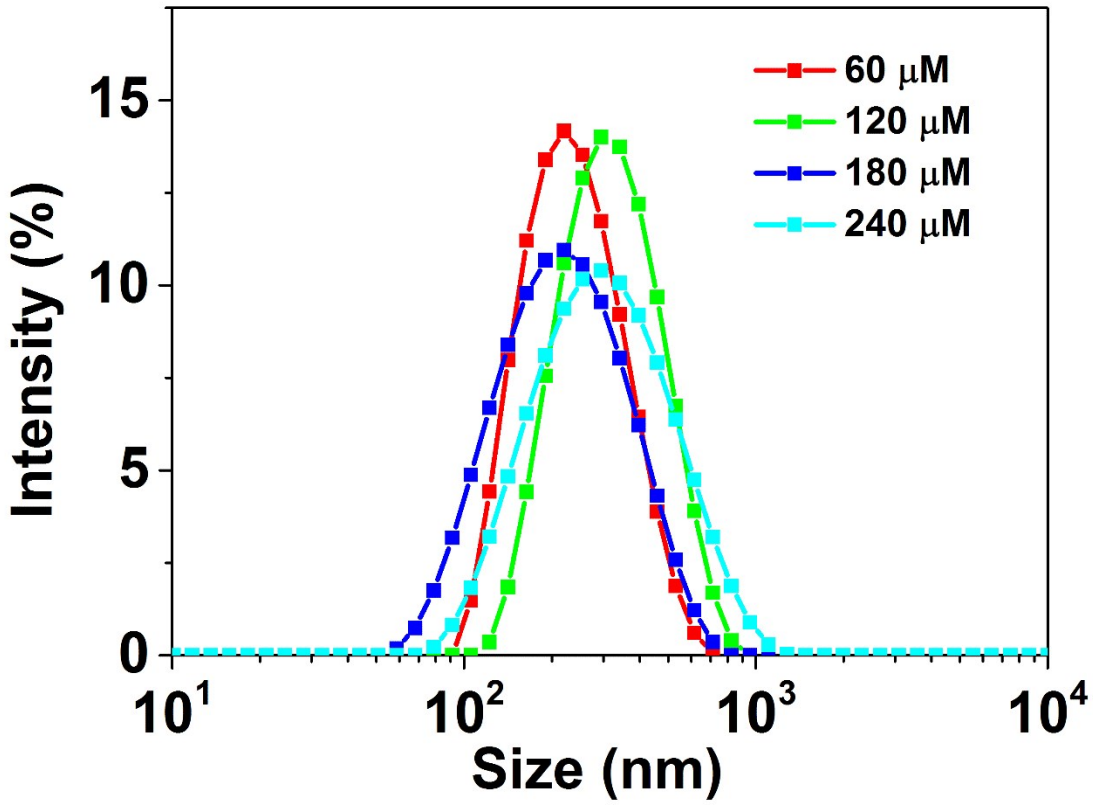


Fig. S21 Size distributions of CNDSA with different concentrations under ultrasound.

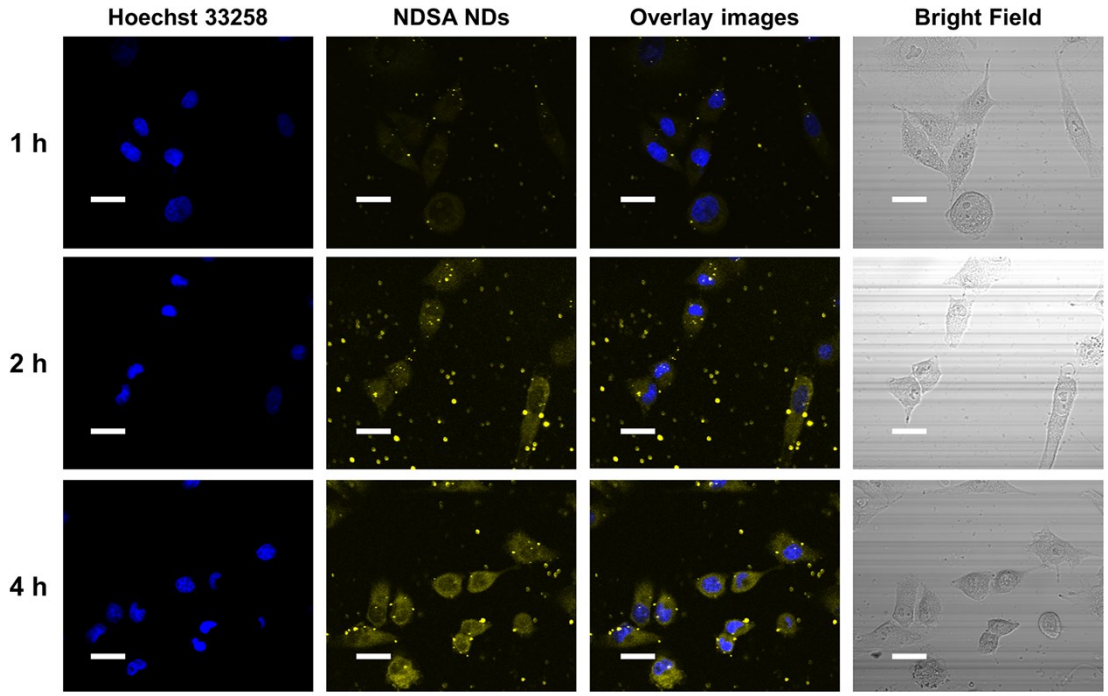


Fig. S22 CLSM images of A549 cells incubated with NDSA NDs for 1 h (upper), 2 h (middle) and 4 h (lower) at 37°C. For each panel, the images from left to right showed nuclei stained with Hoechst 33258 (blue), NDSA NDs fluorescence in cells (yellow), overlays of both images, and the images of bright field. Scale bars, 20 μm.

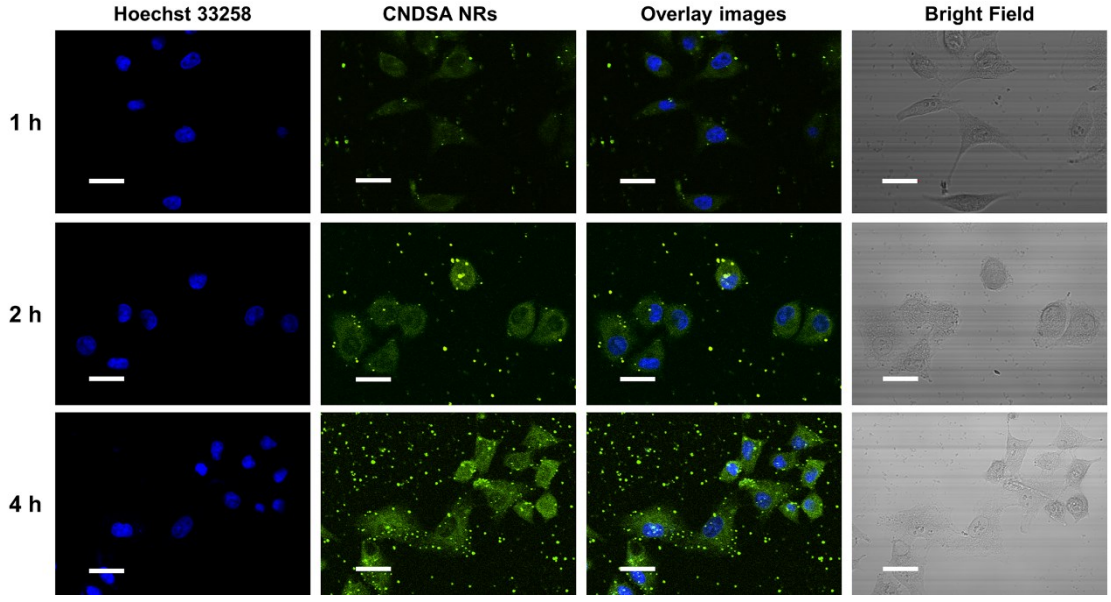


Fig. S23 CLSM images of A549 cells incubated with CNDSA NRs for 1 h (upper), 2 h (middle) and 4 h (lower) at 37°C. For each panel, the images from left to right showed nuclei stained with Hoechst 33258 (blue), CNDSA NRs fluorescence in cells (green), overlays of both images, and the images of bright field. Scale bars, 20 μm.

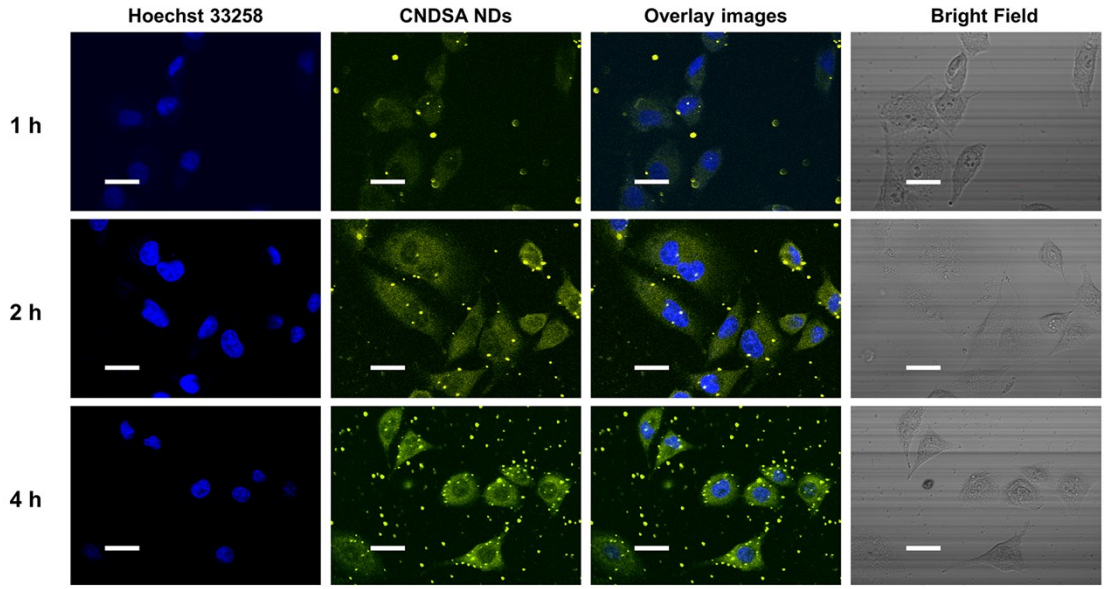


Fig. S24 CLSM images of A549 cells incubated with CNDSA NDs for 1 h (upper), 2 h (middle) and 4 h (lower) at 37°C. For each panel, the images from left to right showed nuclei stained with Hoechst 33258 (blue), CNDSA NDs fluorescence in cells (green), overlays of both images, and the images of bright field. Scale bars, 20 μm.

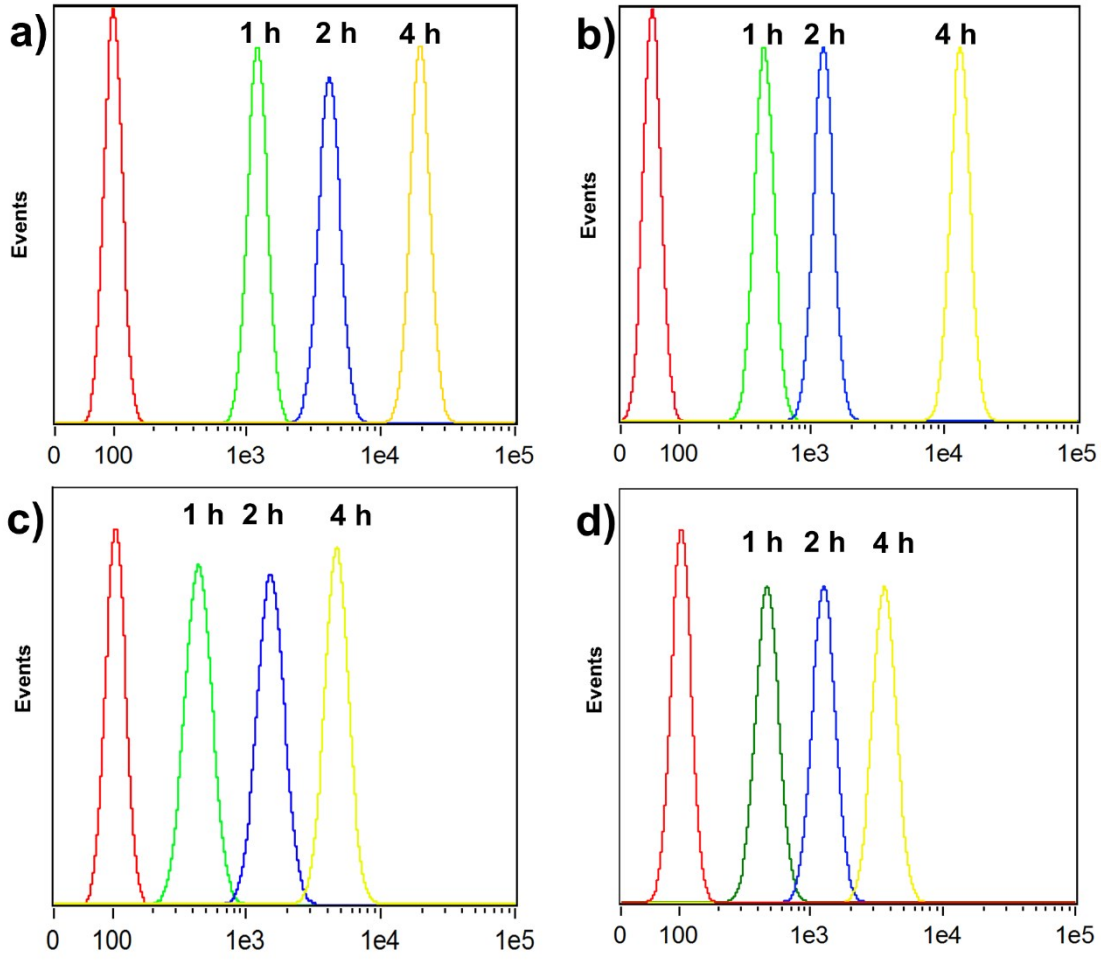


Fig. S25 Flow cytometry histograms of A549 cells treated with the (a) NDSA NRs, (b)

NDSA NDs, (c) CDSA NRs, (d) CNDSA NDs, and without treatment (control) for different time periods (red: control).

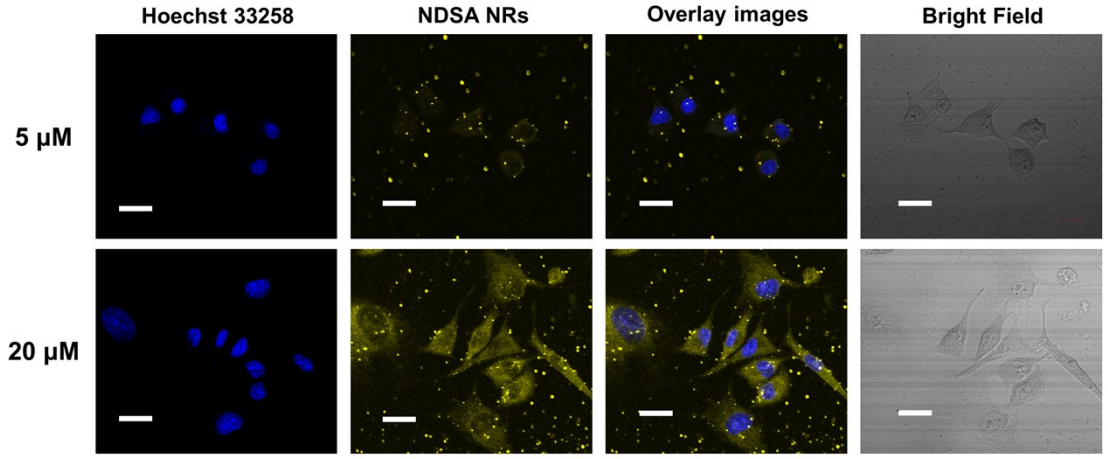


Fig. S26 CLSM images of A549 cells incubated with NDSA NRs with the NDSA concentration of 5 μM (upper) and 20 μM (lower) for 2 h at 37°C. For each panel, the images from left to right showed nuclei stained with Hoechst 33258 (blue), NDSA NRs fluorescence in cells (yellow), overlays of both images, and the images of bright field. Scale bars, 20 μm.

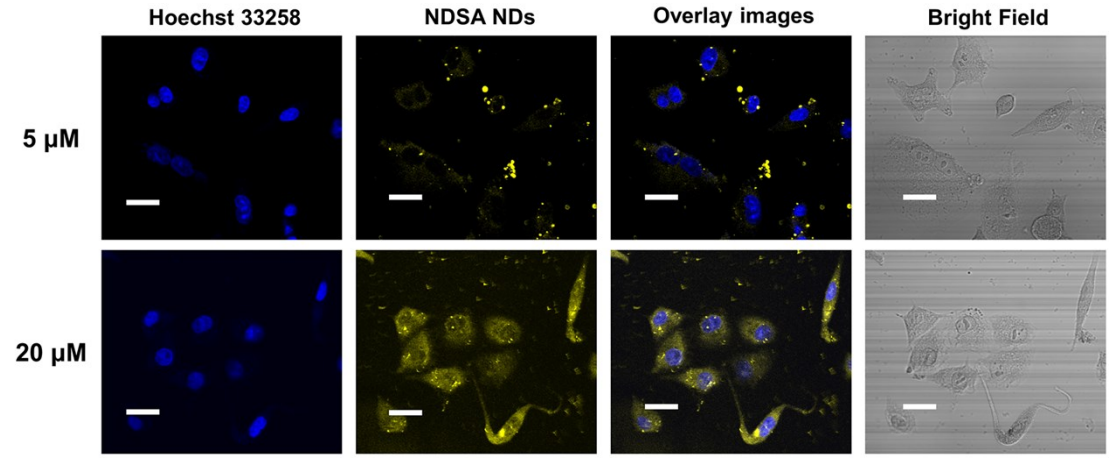


Fig. S27 CLSM images of A549 cells incubated with NDSA NDs with the NDSA concentration of 5 μM (upper) and 20 μM (lower) for 2 h at 37°C. For each panel, the images from left to right showed nuclei stained with Hoechst 33258 (blue), NDSA NDs fluorescence in cells (yellow), overlays of both images, and the images of bright field. Scale bars, 20 μm.

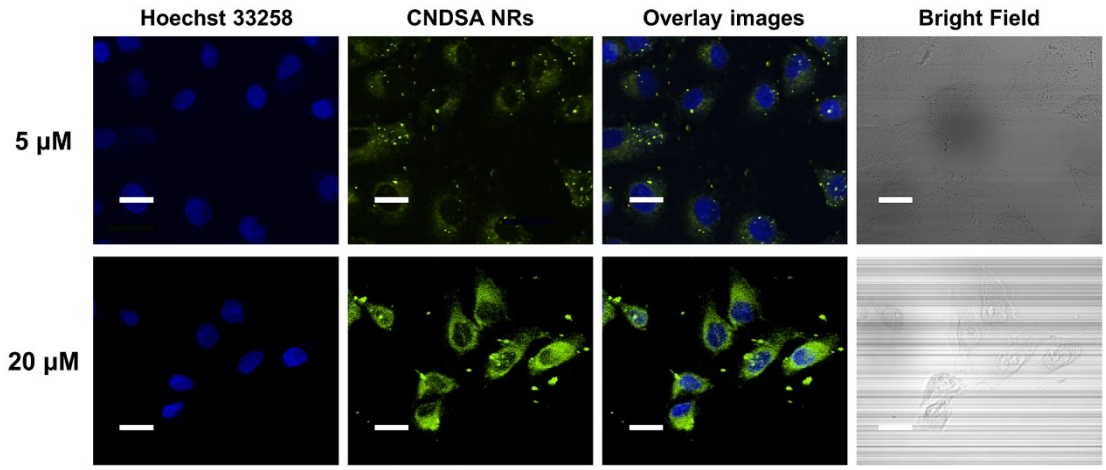


Fig. S28 CLSM images of A549 cells incubated with CNDSA NRs with the CNDSA concentration of 5 μM (upper) and 20 μM (lower) for 2 h at 37°C. For each panel, the images from left to right showed nuclei stained with Hoechst 33258 (blue), CNDSA NRs fluorescence in cells (green), overlays of both images, and the images of bright field. Scale bars, 20 μm.

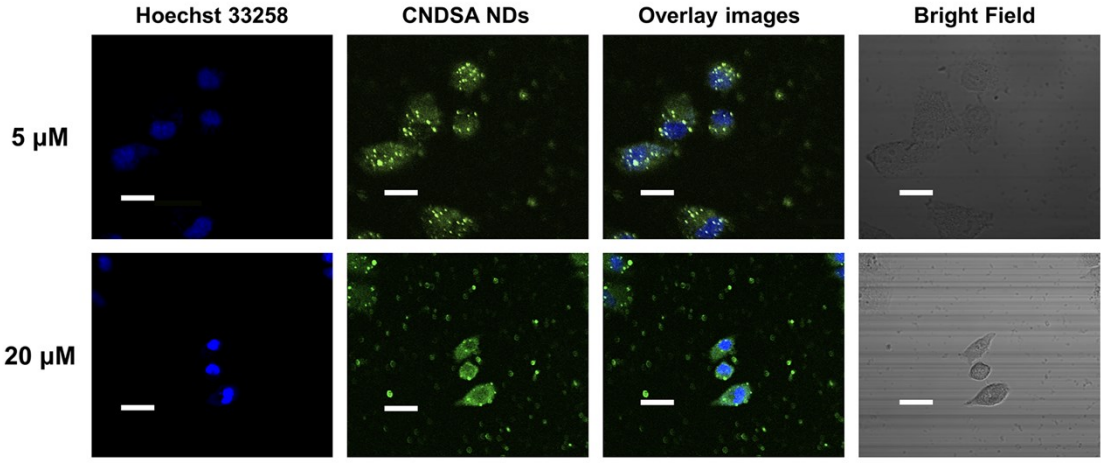


Fig. S29 CLSM images of A549 cells incubated with CNDSA NDs with the CNDSA concentration of 5 μM (upper) and 20 μM (lower) for 2 h at 37°C. For each panel, the images from left to right showed nuclei stained with Hoechst 33258 (blue), CNDSA NDs fluorescence in cells (green), overlays of both images, and the images of bright field. Scale bars: 20 μm.

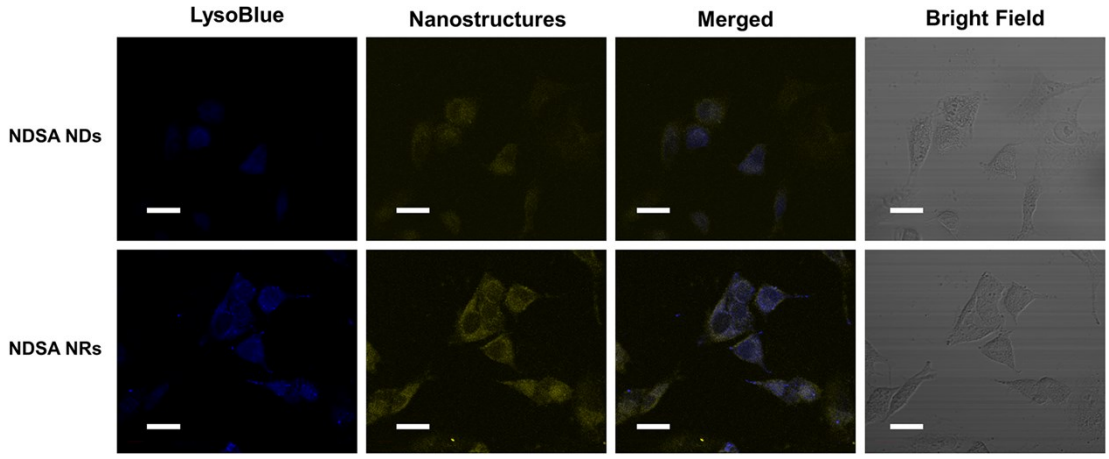


Fig. S30 Colocalization images of A549 cells treated with NDSA NDs (upper) or NDSA NRs (lower) for 2 h. For each panel, the images from left to right showed lyso-Tracker fluorescence (blue) in lysosomes, NDSA fluorescence in cells (yellow), overlays of both images, and the bright field. Scale bars, 20 μm.

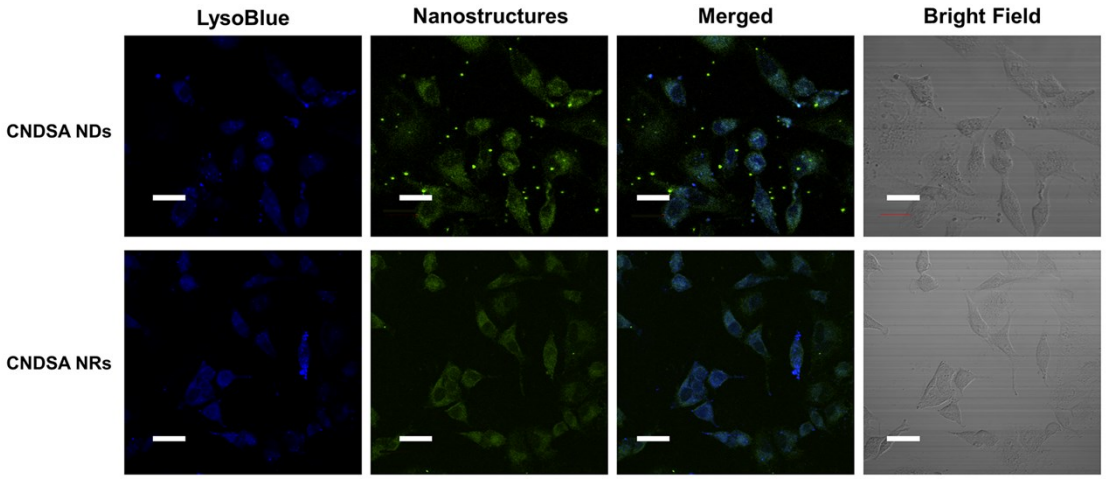


Fig. S31. Colocalization images of A549 cells treated with CNDSA NDs (upper) or CNDSA NRs (lower) for 2 h. For each panel, the images from left to right showed lyso-Tracker fluorescence (blue) in lysosomes, CNDSA fluorescence in cells (green), overlays of both images, and the bright field. Scale bars, 20 μm.

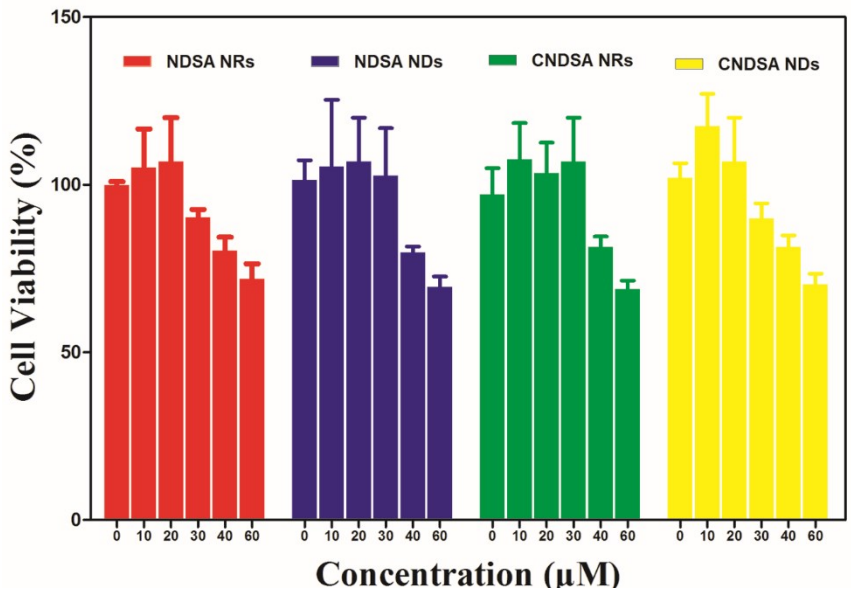


Fig. S32 Cell viability of A549 cells after incubation with various concentrations of NDSA NRs, NDSA NDs, CNDSA NRs or CNDSA NDs for 24 h.

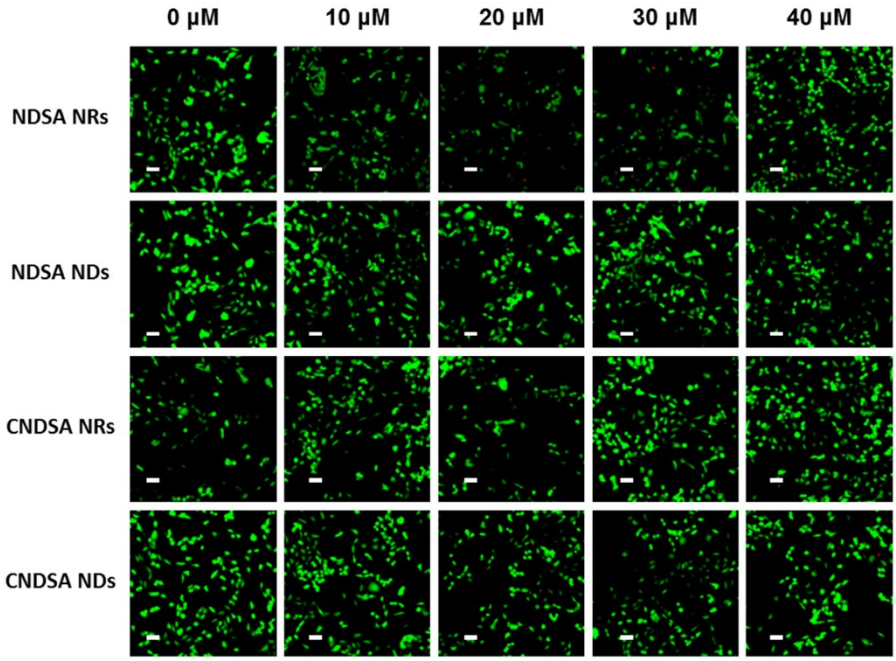


Fig. S33 Fluorescence images of propidium iodide (red, dead cells) and calcein AM (green, live cells) costained A549 cells after incubation with different concentration of NDSA NRs, NDSA NDs, CNDSA NRs or CNDSA NDs for 24 h at 37°C. Scale bars, 100 μm.

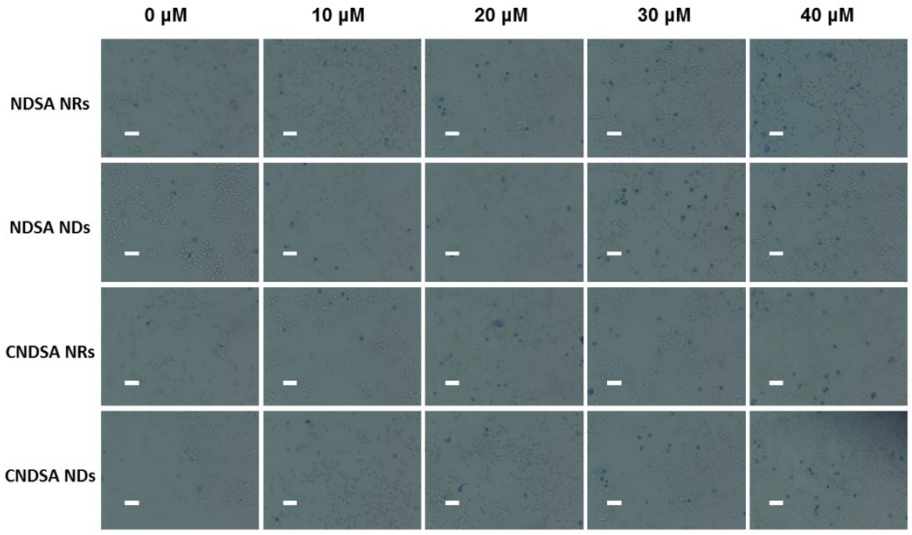


Fig. S34 The A549 cell images were stained by Trypan Blue after incubation with different concentrations of NDSA NRs, NDSA NDs, CNDSA NRs or CNDSA NDs for 24 h at 37°C. Scale bars, 100 μm.

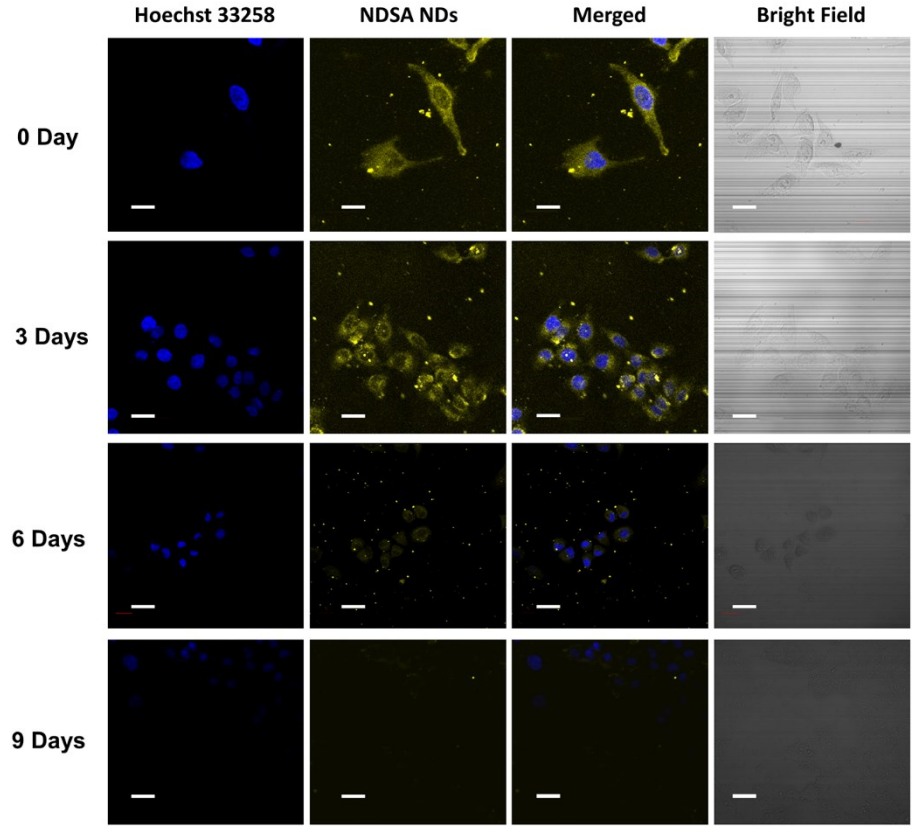


Fig. S35 Long-term cell tracing CLSM images of the NDSA NDs incubated at 37°C for 4 h and then subcultured for fixed time intervals including day 0; day 3; day 6; day 9. Scale bars, 20 μm.

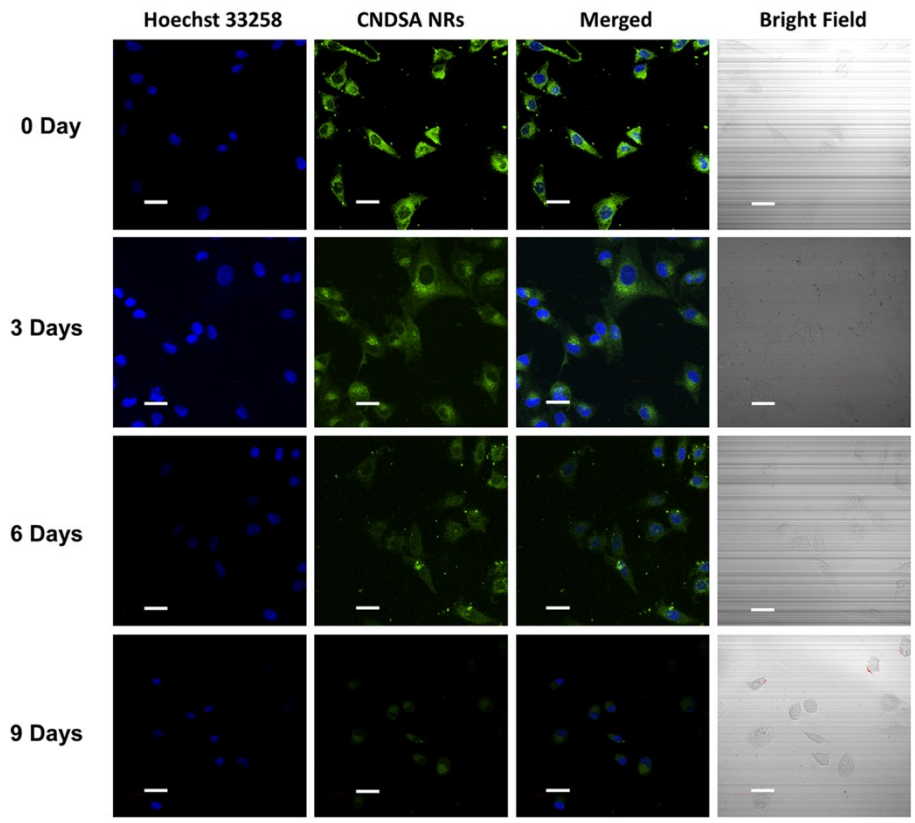


Fig. S36 Long-term cell tracing CLSM images of CNDSA NRs incubated at 37°C for 4 h and then subcultured for fixed time intervals including day 0; day 3; day 6; day 9. Scale bars, 20 μm.

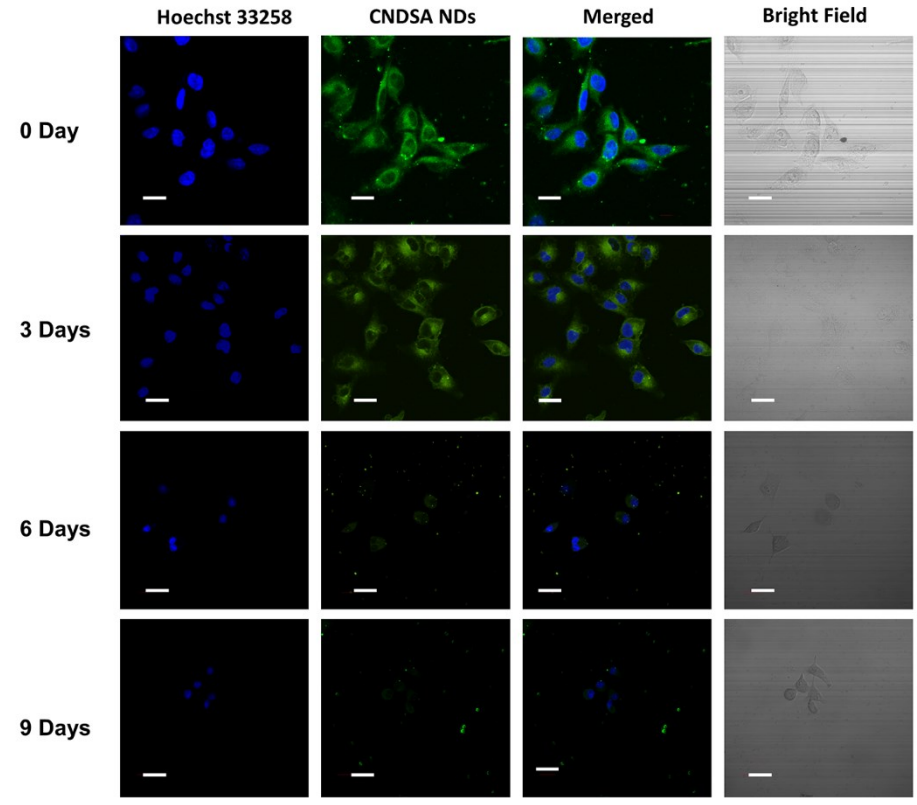


Fig. S37 Long-term cell tracing CLSM images of CNDSA NDs incubated at 37°C for 4 h

and then subcultured for fixed time intervals including day 0; day 3; day 6; day 9. Scale bars, 20 μm.

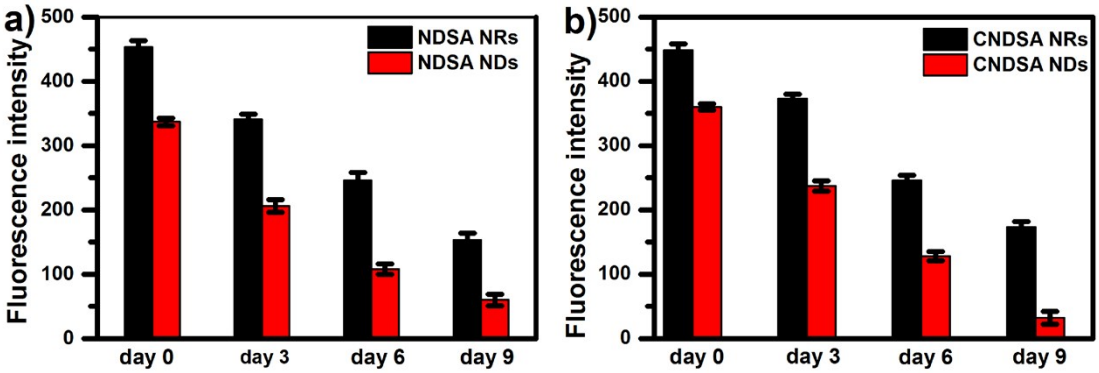


Fig. S38 Time-dependent fluorescence intensity changes for the cells treated with (a) NDSA NRs, NDSA NDs, and (b) CNDSA NRs, CNDSA NDs, respectively.