Supporting Information for

Novel disulfide bond bridged 7-ethyl-10-hydroxyl camptothecin-undecanoic acid conjugate/human serum albumin nanoparticles for breast cancer therapy

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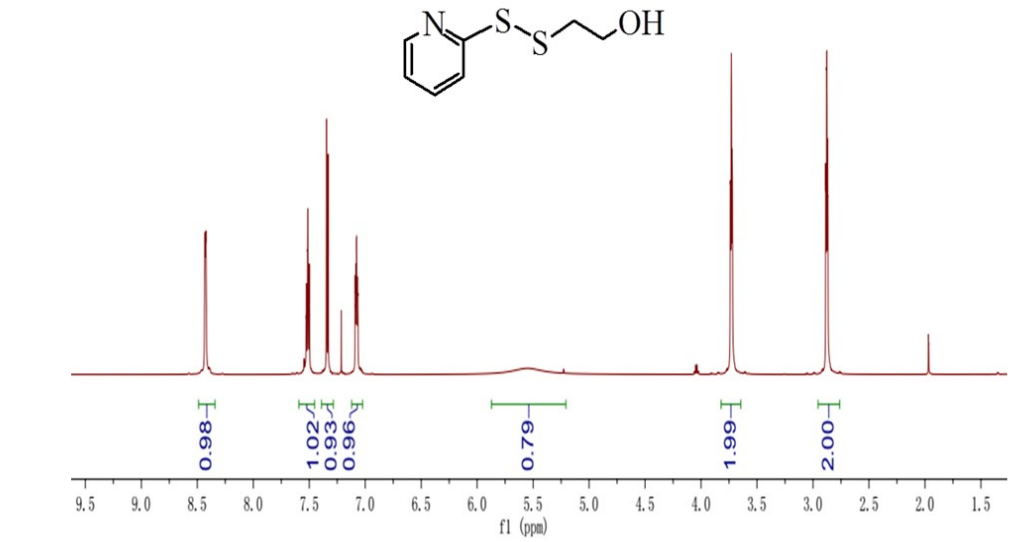
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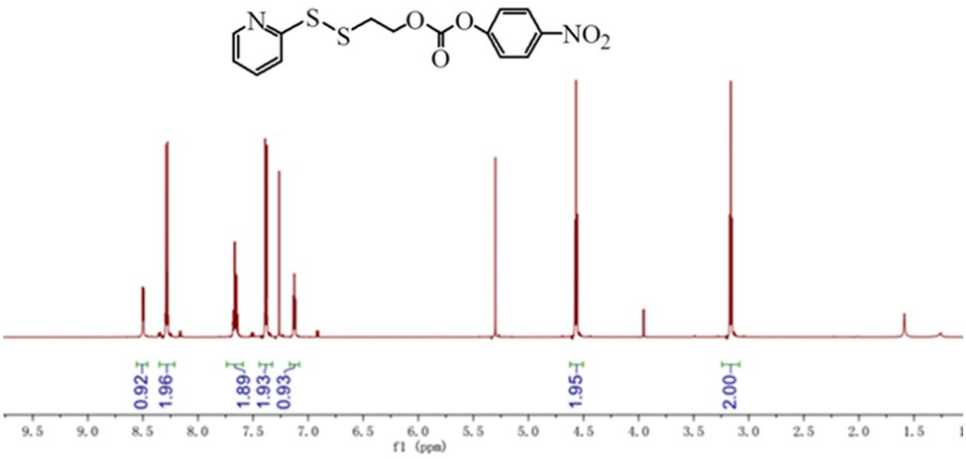
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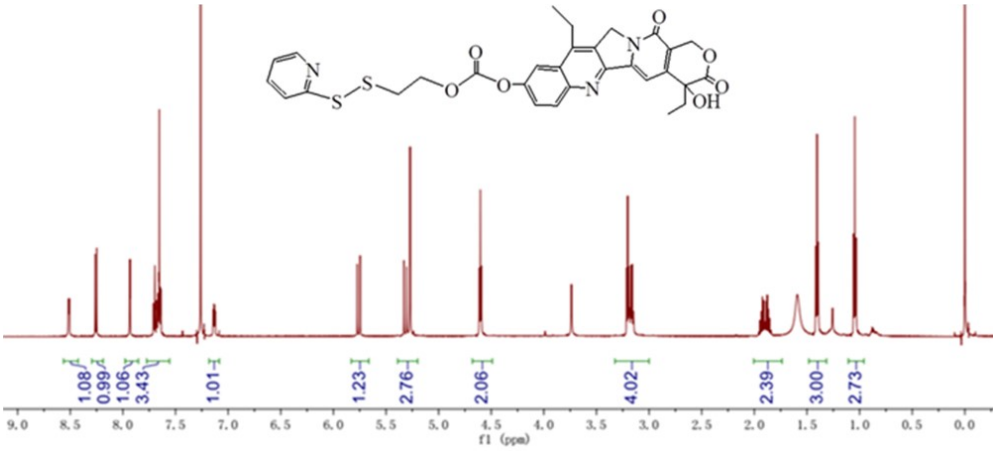
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f1 (ppm)

Figure S1. ^{1}H NMR spectra. (A) 2-(Pyridin-2-yldisulfanyl)-ethanol. (B) 4-Nitrophenyl (2-(pyridin-2-yldisulfaneyl)ethyl) carbonate. (C) SN38-SS-Py.

(A) ^{1}H NMR (600 MHz, $CDCl_3$): δ 8.50–8.33 (m, 1H), 7.63–7.46 (m, 1H), 7.35 (t, *J* = 10.3 Hz, 1H), 7.16–6.97 (m, 1H), 5.39 (s, 1H), 3.84–3.60 (m, 2H), 2.98–2.76 (m, 2H).

(B) ^{1}H NMR (600 MHz, CDCl3) δ 8.43 (d, J = 4.7 Hz, 1H), 8.28–8.15 (m, 2H), 7.6 – 7.49 (m, 2H), 7.39–7.23 (m, 2H), 7.05 (ddd, J = 23.1, 12.3, 9.9 Hz, 1H), 4.50 (t, J = 6.4 Hz, 2H), 3.09 (t, J = 6.4 Hz, 2H).

(C) ^{1}H NMR (600 MHz, $CDCl_3$): δ 8.51 (d, J = 4.6 Hz, 1H), 8.26 (d, J = 9.2 Hz, 1H), 7.93 (d, J = 2.5 Hz, 1H), 7.79–7.59 (m, 3H), 7.13 (dt, J = 29.3, 12.2 Hz, 1H), 5.76 (d, J = 16.2 Hz, 1H), 5.38–5.21 (m, 3H), 4.66–4.55 (m, 2H), 3.27–3.06 (m, 4H), 2.02–1.79 (m, 2H), 1.40 (t, J = 7.7 Hz, 3H), 1.05 (t, J = 7.4 Hz, 3H).

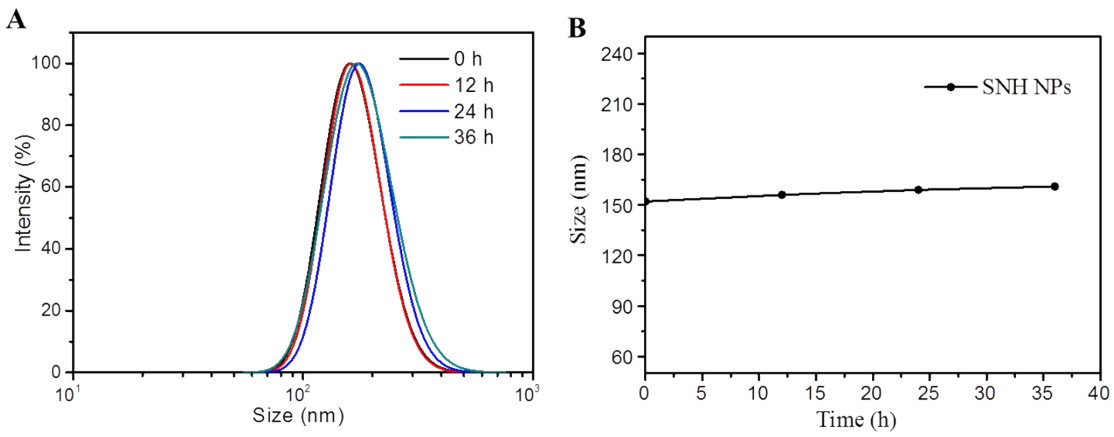

Figure S2. (A-B) Stability analysis of the SNH NPs with feed mole ratio 9:1 of SN38-SS-COOH:HSA based on the change of particle size at different time by DLS.

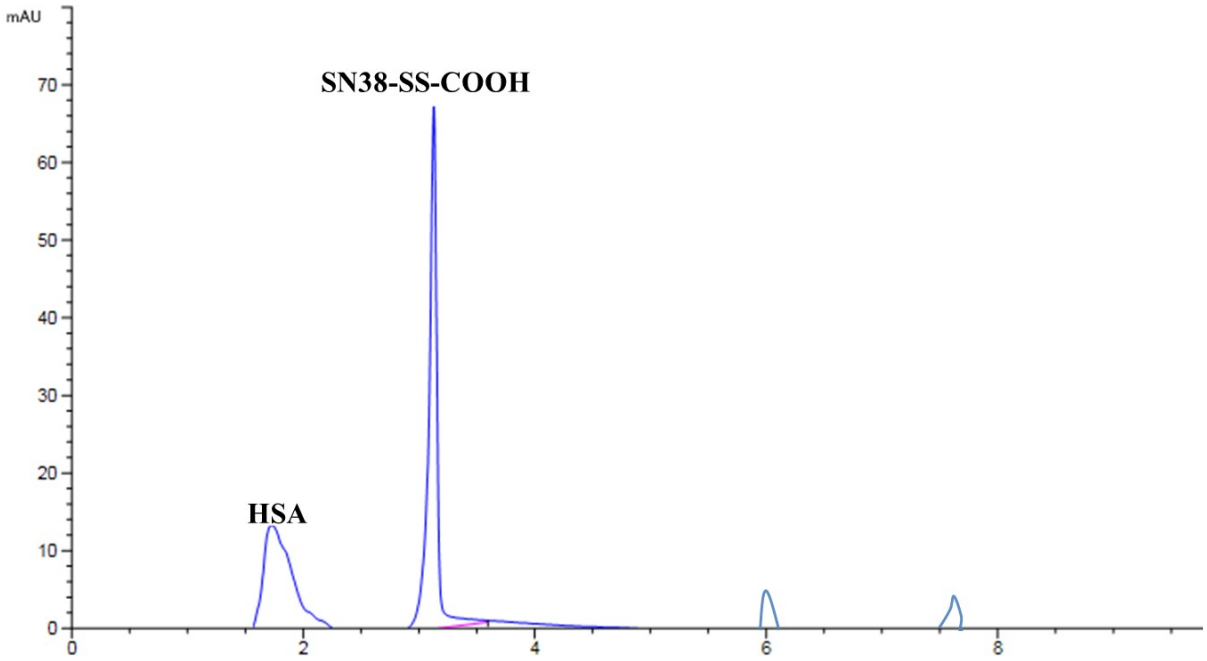

Figure S3. HPLC spectrum of the SNH NPs after 24 h incubation in PBS.

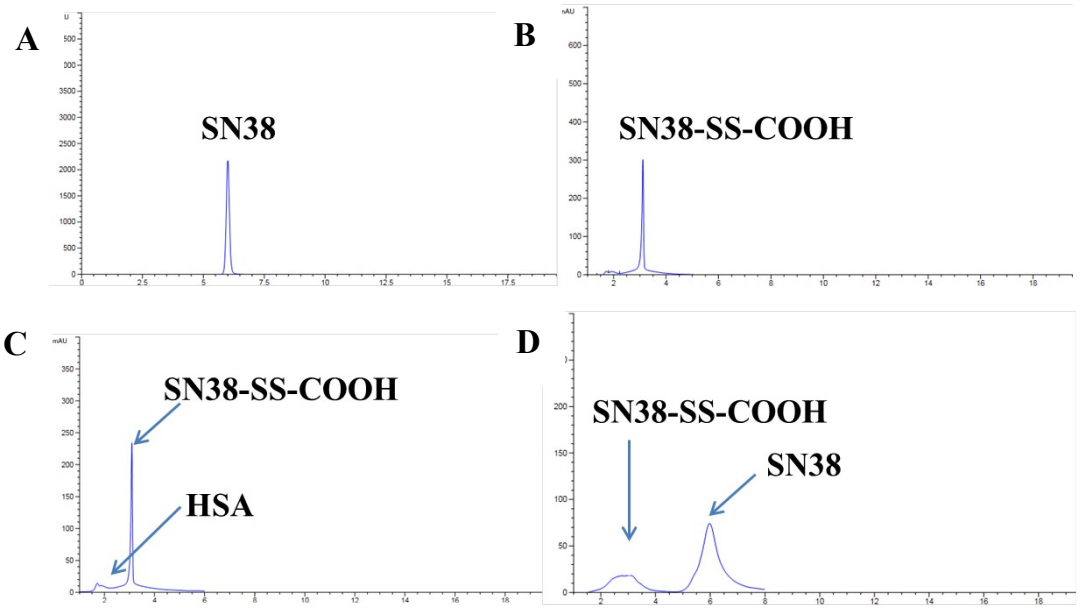

Figure S4. HPLC spectra. (A) SN38. (B) SN38-SS-COOH conjugate. (C) SNH NPs. (D) SNH NPs incubation in PBS with 20 mM GSH for 6 h.

Table S1. Physicochemical properties of the SNH NPs encapsulated with DiR.

PS[a]	PDI[b]	ZP[c]/mV	LE[d]/%	LE[e]/%
163±5.84	0.183±0.053	-16.43±1.58	7.13	3.57

[a]Particle size, [b]Polydispersity index, [c]Zeta potential, [d]Loading efficiency of prodrug, [e]Loading efficiency of DiR.

Table S2. Cytotoxicity (IC_{50} [a] values) of free SN38, free SN38-SS-COOH, irinotecan and SNH NPs against four cancer cell lines by MTT assay.

Group	IC_{50} (nmol/L) in 231 cells	IC_{50} (nmol/L) in MCF-7 cells	IC_{50} (nmol/L) in KB cells	IC_{50} (nmol/L) in HeLa cells
Free SN38	225±53	117±76	135±45	451±113
Free SN38-SS-COOH	$>10^4$	$>10^4$	2836±248	5291±534
Irinotecan	$>10^4$	$>10^4$	4038±563	$>10^4$
SNH NPs	1462±235	1893±354	1598±344	2165±387

a) Half inhibitory concentration, presented as equivalent concentrations of SN38.