Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

Positively Charged, Surfactant-Free Gold Nanoparticles for Nucleic Acid Delivery

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Table S1. The concentration of Au NPs leading to 50 % cell growth inhibition (IC50) in human and mouse cancer cells.

	Hep G2 (µg/mL)	Caco-2 (µg/mL)	PC3 (µg/mL)	B16F10 (µg/mL)	CT26 (µg/mL)
20 nm Au-CATB	3.1	3.7	2	3.5	3.5
60 nm Au-CATB	3.2	3.4	3.5	3.8	3.8
RG5 AuNPs-Lcysteine	6.8	7.8	8.2	9.2	8.2
RG7 AuNPs-Lcysteine	7.2	8.8	7.8	8.9	8.1
RG8 AuNPs-Lcysteine	7.1	8.5	8.2	8.5	9.0
RG9 AuNPs-Lcysteine	6.7	8.7	7.4	9.4	8.7
RG11 AuNPs-Lcysteine	6.9	9.0	8.5	9.1	8.4
RG12 AuNPs-Lcysteine	7.0	8.7	8.0	8.4	9.1

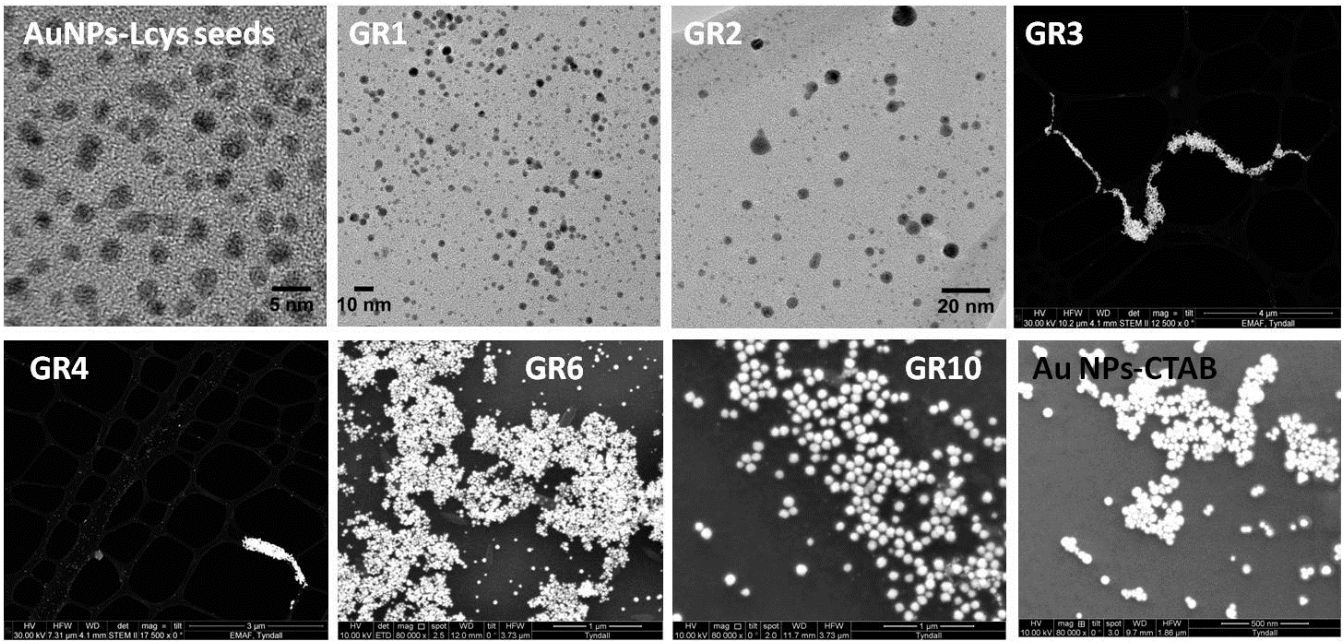
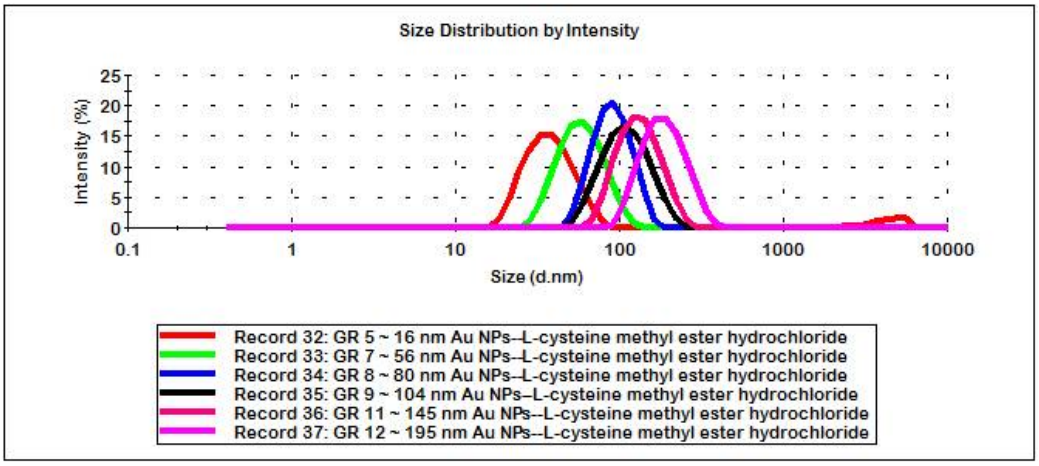
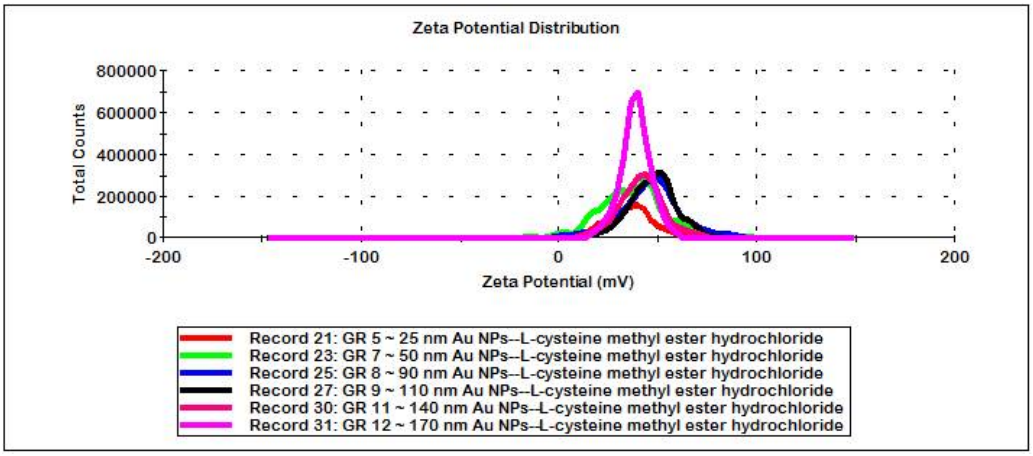


Figure S1. TEM (seeds, GR1 and GR2) and SEM of Au-L-cysteine nanoparticles produced in this study and not used in the cytotoxicity assays, with mean diameters of (seeds) ~2 nm, (GR1) ~ 4 nm, (GR2) ~5.5 nm, (GR3) ~ 7 nm, (GR4) ~9 nm, (GR6) ~46 nm, (GR10) ~118 nm. The sample (Au NPs-CTAB) ~60 nm was used as negative control for cytotoxicity comparison study.

(a)



(b)



(c)

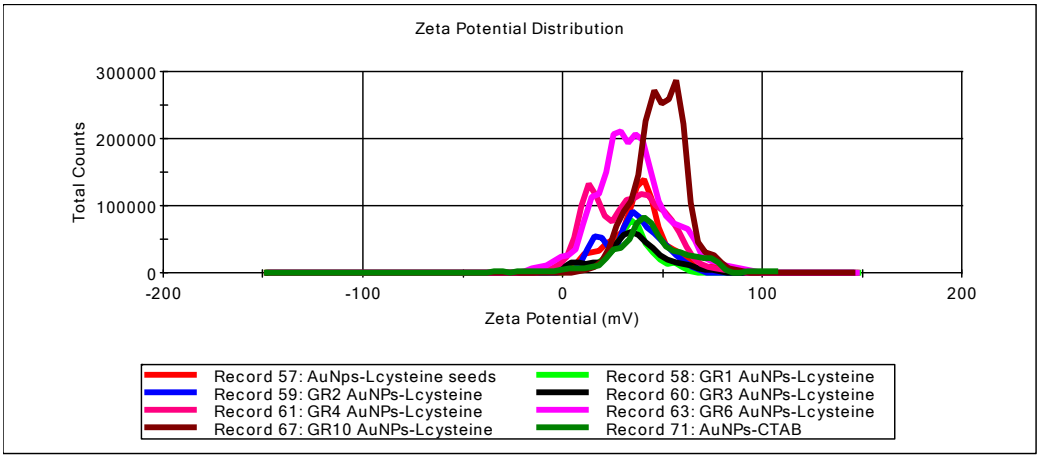


Figure S2. (a) Size distribution by intensity for Au NPs-L-cysteine methyl ester hydrochloride sanples produced in this study and used for cytotoxicity assay. (b) and (c) Zeta potential of Au-L-cysteine

nanoparticles. The sample (Au NPs-CTAB) ~60 nm was used as negative control for cytotoxicity study.

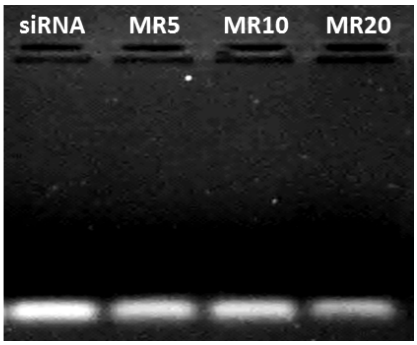


Figure S3. Complexation of siRNA (0.25 μg) with a GR8 nanoparticle sample at different mass ratios (MRs of Au to siRNA, MR = 5, 10 and 20). 0.25 μg of siRNA was used as negative control.

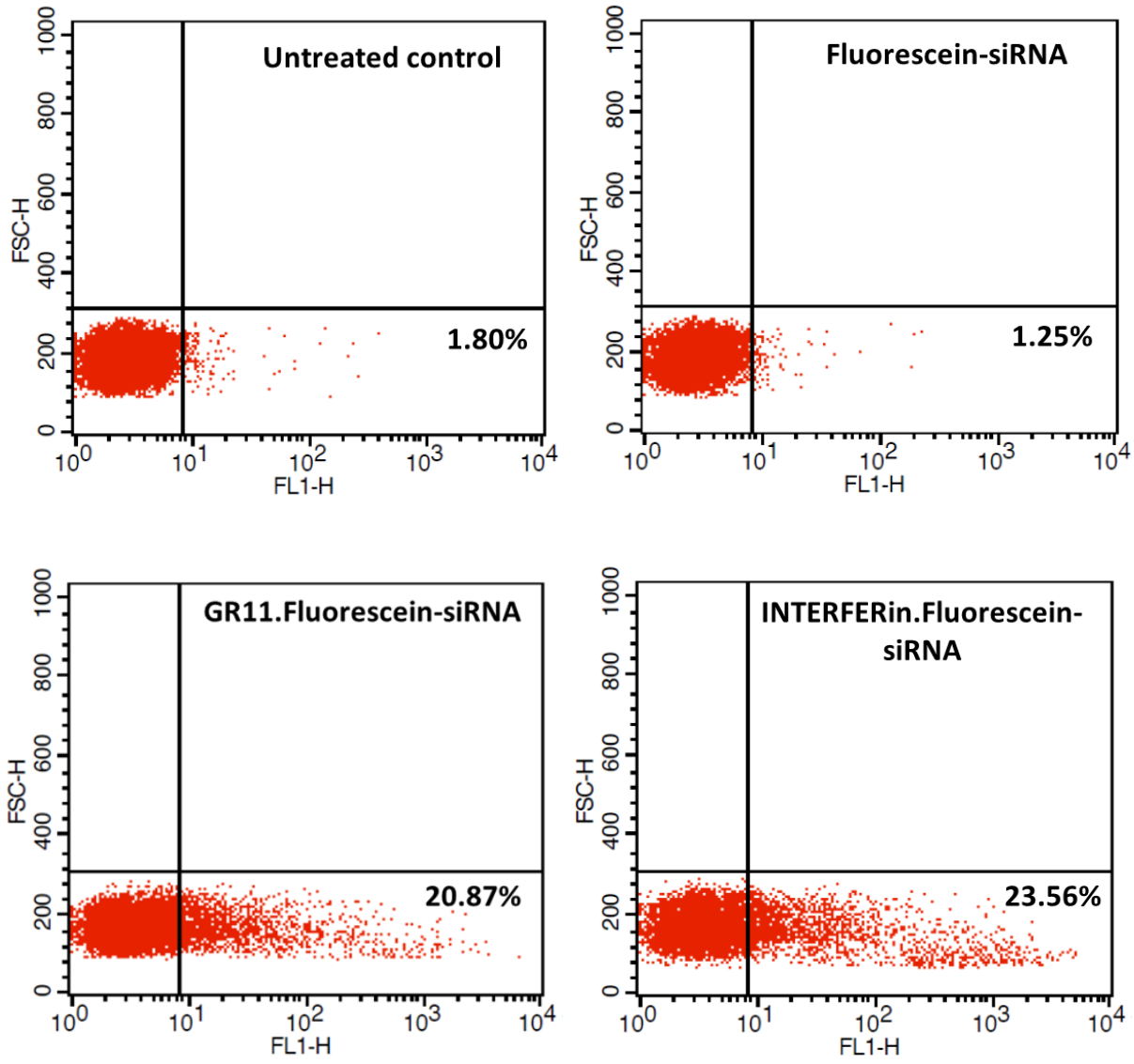


Figure S4. The representative Dot Plots showing fluorescein-positive cells (%) resulting from fluorescein-siRNA (20 nM) either uncomplexed or complexed with GR11 (MR20) and INTERFERin™.

We noted that samples of Au NPs- L-cysteine (GR1-GR4) were stable for more than two weeks, whilst GR5-GR12 solutions were stable for more than four month when stored at 4 °C. Moreover, Au NP- L-cysteine samples with bigger diameters precipitate by gravity but could be redispersed easily with shaking without noticeable aggregation.