

Supplementary Information

for

A Simple Synthesis of Reduction-Responsive Acrylamide-Type Nanogels for miRNA Delivery

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Table S1. Monomer feed composition based on moles and mass

Formulation ^a	DMAM		ATC		CBA		LAP	
	mg	mmol	mg	mmol	mg	mmol	mg	mmol
NG	183.6	1.852	21.5	0.111	26.0	0.099	2.3	0.008

^a Total volume of aqueous phase and organic phase were 1 mL and 10 mL, respectively.

Table S2. Post-polymerization loading

Nanogels	NG (mg) ^a	ATC (mmol)	N/P ratio
NG	-	-	-
NG/a-miR21-1	5.0	2.38	10
NG/a-miR21-2	2.5	1.19	5
NG/a-miR21-3	1.0	0.48	2

^a miRNA was loaded at concentration of 100 pmol/μL (100 μL).

Standard curve of Cy5-a-miR21 in PBS (pH 7.4)

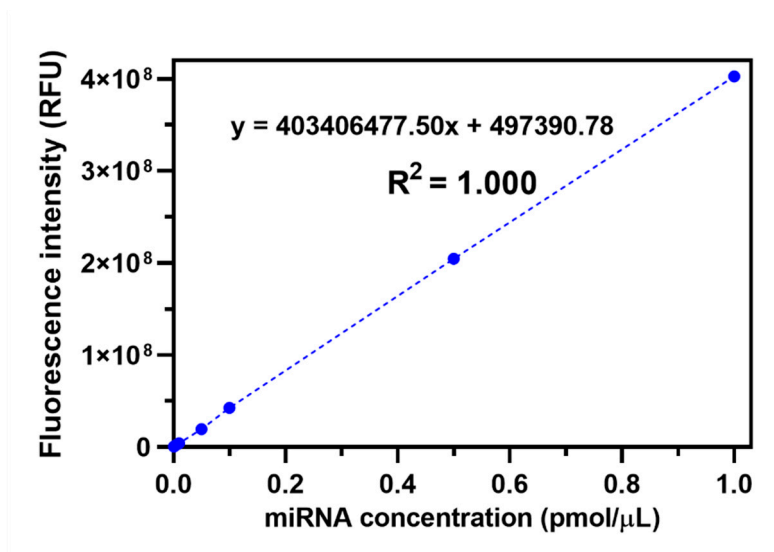


Figure S1. Standard curve of Cy5-a-miR21 in PBS (pH 7.4). The standard curve was created from different concentrations of a-miR21: 0.0005, 0.001, 0.005, 0.01, 0.05, 0.1, 0.5, and 1.0 pmol/ μ L. Data were reported as mean $\pm$ SD ($n = 4$).

Fluorescence spectra of Cy5-a-miR21 and NG/Cy5-a-miR21

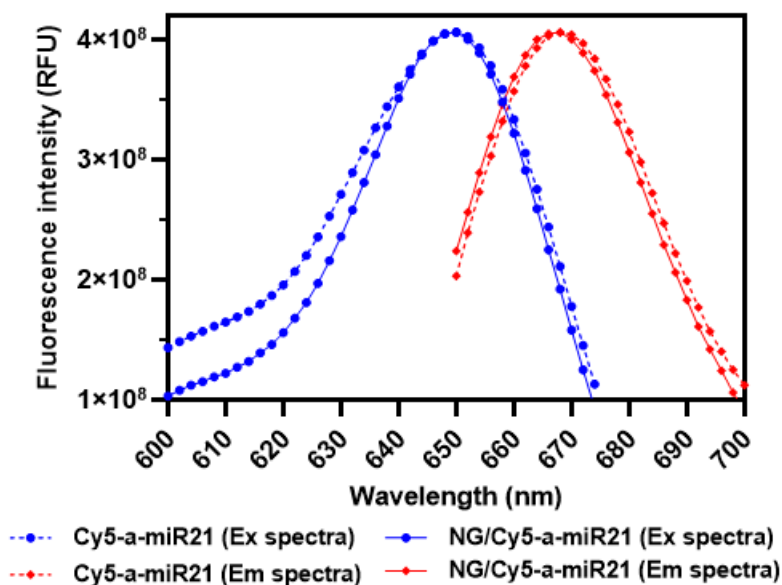


Figure S2. Fluorescence spectra of Cy5-a-miR21 and NG/Cy5-a-miR21 in PBS (pH 7.4). Both Cy5-a-miR21 and NG/Cy5-a-miR21 indicated the same Ex/Em max (regardless of a relatively different spectra particularly at 600–635 nm excitation area). For analysis purposes (standard curve generation, miRNA loading analysis, and miRNA release study) we used the maximum wavelengths: 650 and 675 nm for the Ex and Em, respectively.

DLS measurements of nanogels

	Size (d.nm):	% Intensity:	St Dev (d.nm):
Z-Average (d.nm): 92.47	Peak 1: 116.2	95.4	63.16
Pdl: 0.429	Peak 2: 4985	3.4	667.3
Intercept: 0.974	Peak 3: 591.0	1.3	142.6
Result quality : Good			

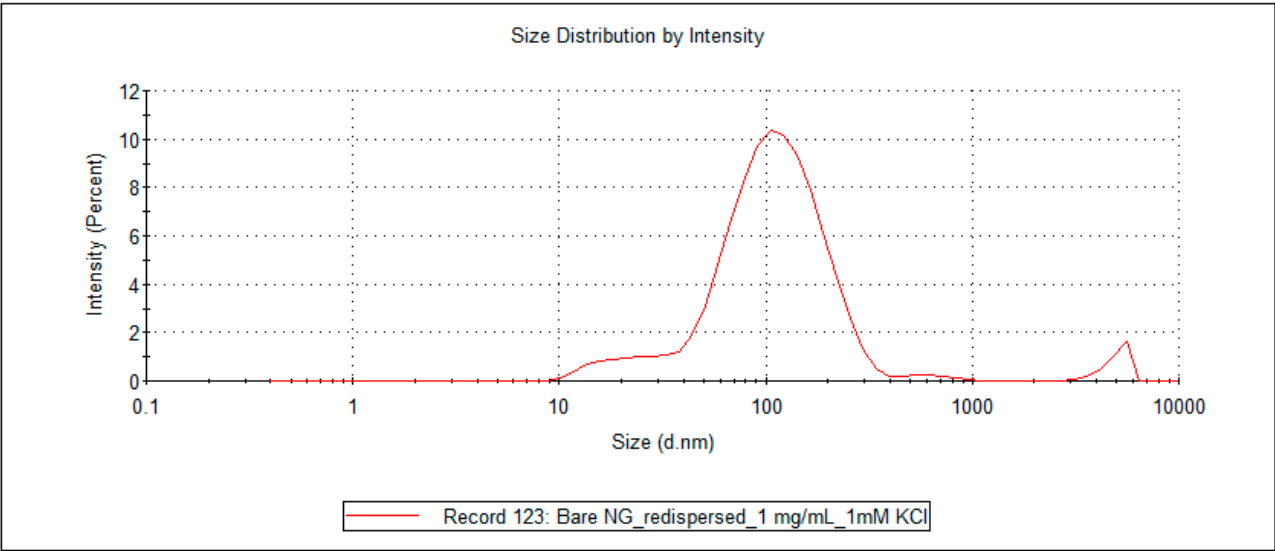


Figure S3. Average size distribution (d_H) of bare NG in 1 mM KCl from four replications.

	Size (d.nm):	% Intensity:	St Dev (d.nm):
Z-Average (d.nm): 109.2	Peak 1: 136.6	96.9	73.50
Pdl: 0.341	Peak 2: 4792	3.1	840.9
Intercept: 0.965	Peak 3: 0.000	0.0	0.000
Result quality : Good			

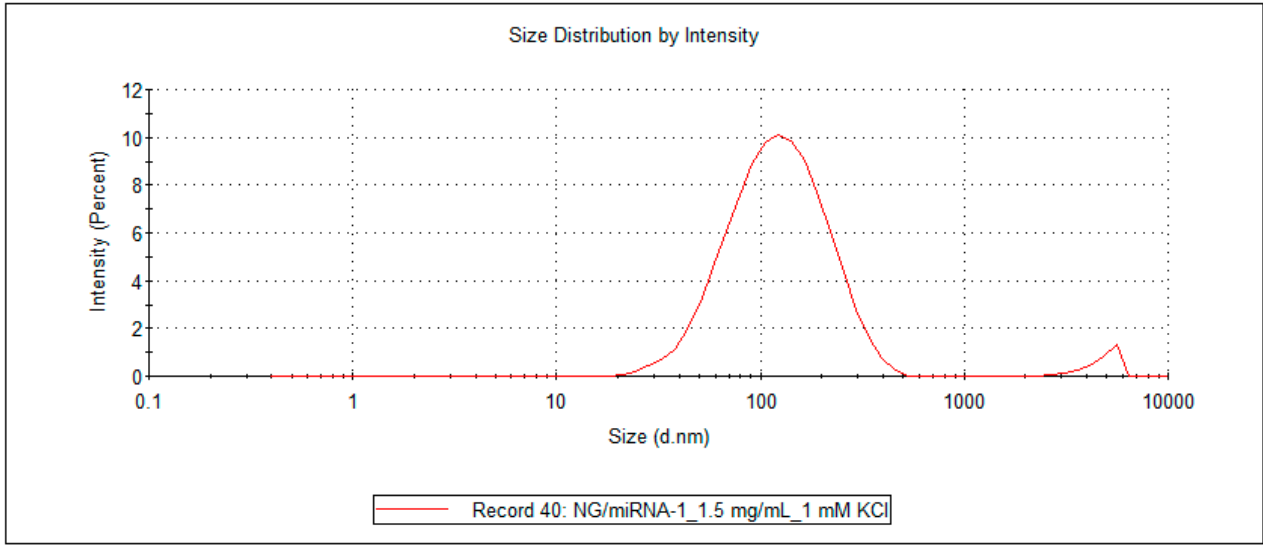


Figure S4. Average size distribution (d_H) of NG/a-miR21-1 in 1 mM KCl from four replications.

	Size (d.nm):	% Intensity:	St Dev (d.nm):
Z-Average (d.nm): 116.8	Peak 1: 144.5	96.5	77.32
Pdl: 0.361	Peak 2: 4961	3.5	693.3
Intercept: 0.964	Peak 3: 0.000	0.0	0.000
Result quality : Good			

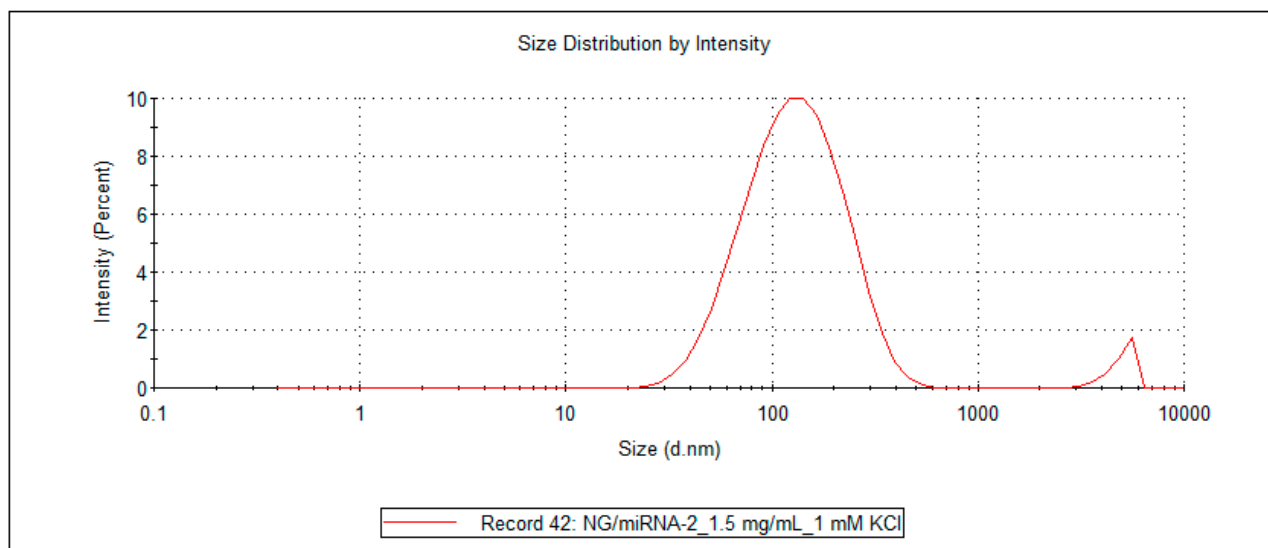


Figure S5. Average size distribution (d_H) of NG/a-miR21-2 in 1 mM KCl from four replications.

	Size (d.nm):	% Intensity:	St Dev (d.nm):
Z-Average (d.nm): 122.1	Peak 1: 191.3	95.1	160.9
Pdl: 0.457	Peak 2: 4390	4.9	997.9
Intercept: 0.952	Peak 3: 0.000	0.0	0.000
Result quality : Good			

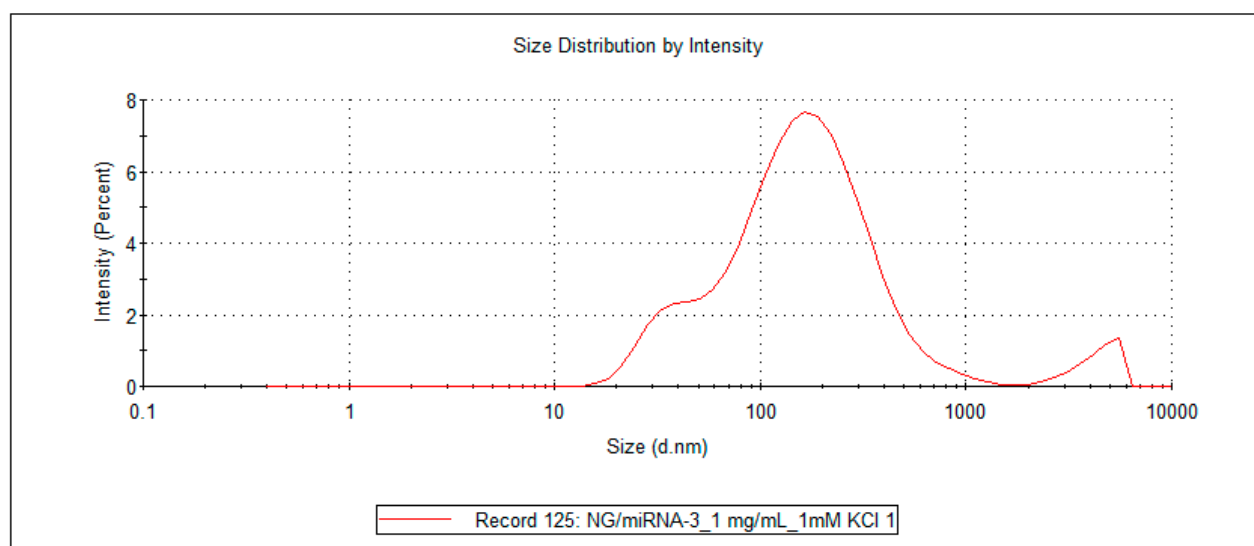


Figure S6. Average size distribution (d_H) of NG/a-miR21-3 in 1 mM KCl from four replications.

Zeta potential (ζ) measurements of nanogels

	Mean (mV)	Area (%)	St Dev (mV)
Zeta Potential (mV): 27.4	Peak 1: 27.4	100.0	3.69
Zeta Deviation (mV): 3.40	Peak 2: 0.00	0.0	0.00
Conductivity (mS/cm): 0.183	Peak 3: 0.00	0.0	0.00
Result quality : Good			

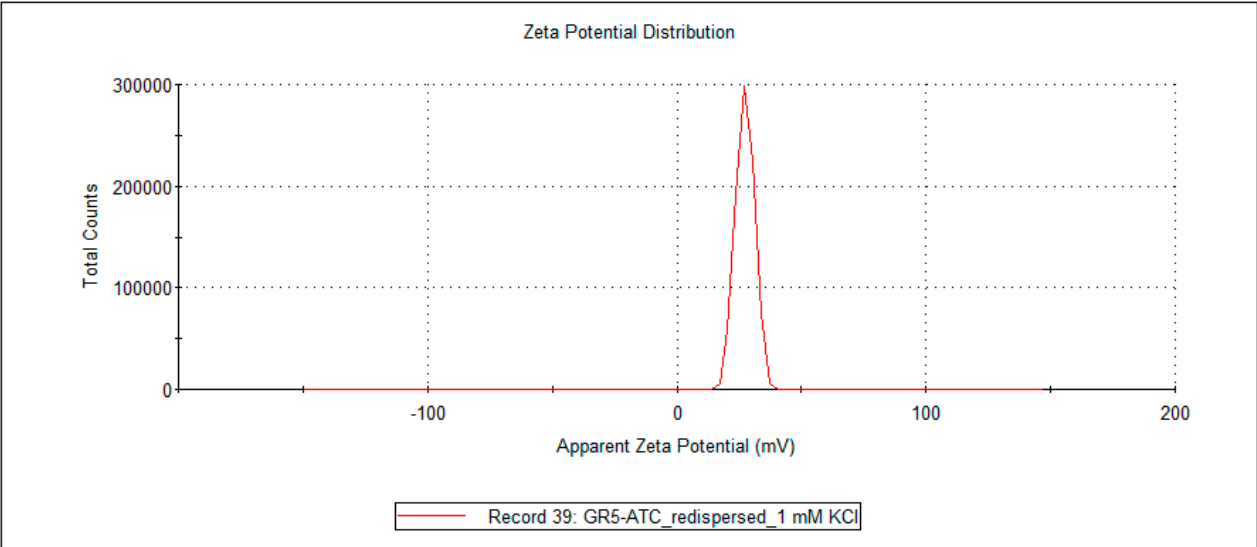


Figure S7. Average ζ potential of bare NG in 1 mM KCl from four replications.

	Mean (mV)	Area (%)	St Dev (mV)
Zeta Potential (mV): 24.2	Peak 1: 24.2	100.0	3.54
Zeta Deviation (mV): 3.43	Peak 2: 0.00	0.0	0.00
Conductivity (mS/cm): 0.187	Peak 3: 0.00	0.0	0.00
Result quality : Good			

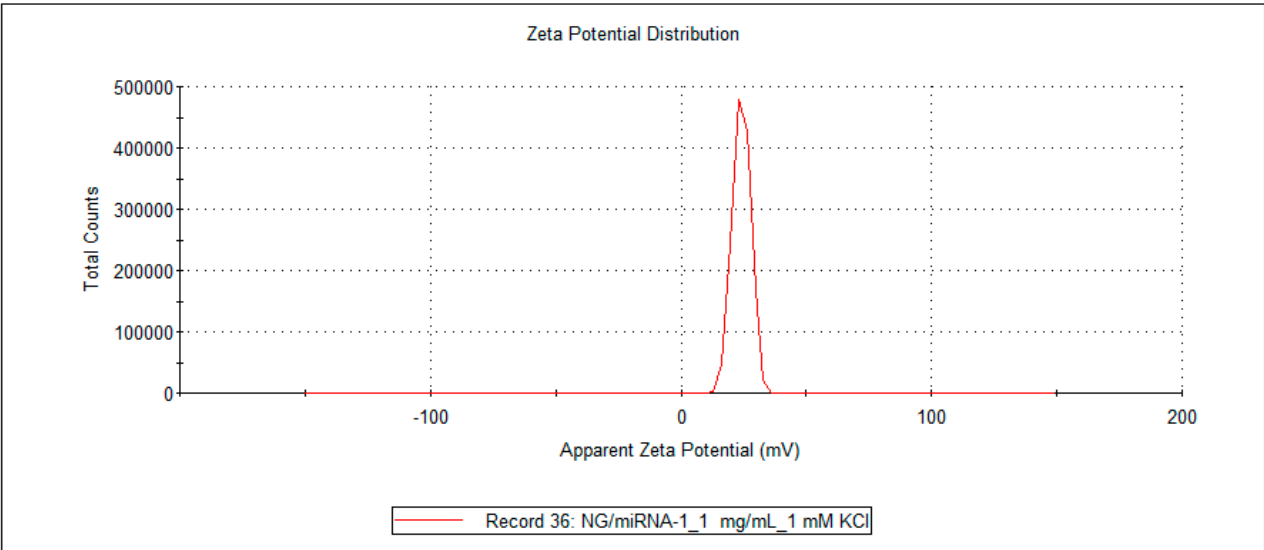


Figure S8. Average ζ potential of NG/a-miR21-1 in 1 mM KCl from four replications.

	Mean (mV)	Area (%)	St Dev (mV)
Zeta Potential (mV): 20.8	Peak 1: 20.8	100.0	4.93
Zeta Deviation (mV): 4.71	Peak 2: 0.00	0.0	0.00
Conductivity (mS/cm): 0.221	Peak 3: 0.00	0.0	0.00
Result quality : Good			

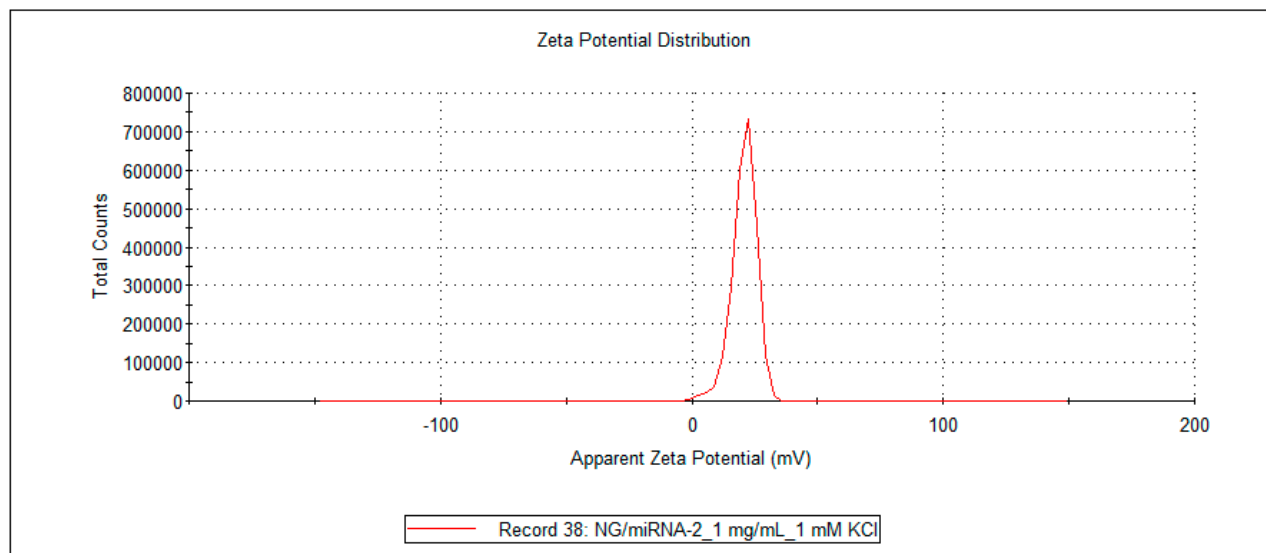


Figure S9. Average ζ potential of NG/a-miR21-2 in 1 mM KCl from four replications.

	Mean (mV)	Area (%)	St Dev (mV)
Zeta Potential (mV): 11.9	Peak 1: 12.0	100.0	6.07
Zeta Deviation (mV): 6.04	Peak 2: 0.00	0.0	0.00
Conductivity (mS/cm): 0.170	Peak 3: 0.00	0.0	0.00
Result quality : Good			

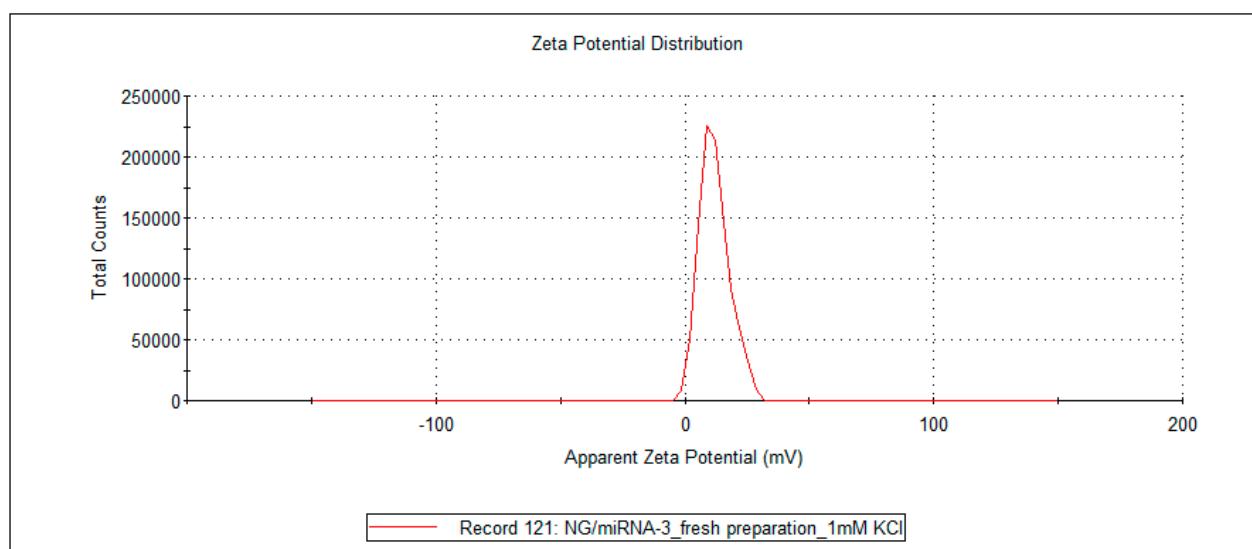


Figure S10. Average ζ potential of NG/a-miR21-3 in 1 mM KCl from four replications.

MiRNA release kinetics from nanogels

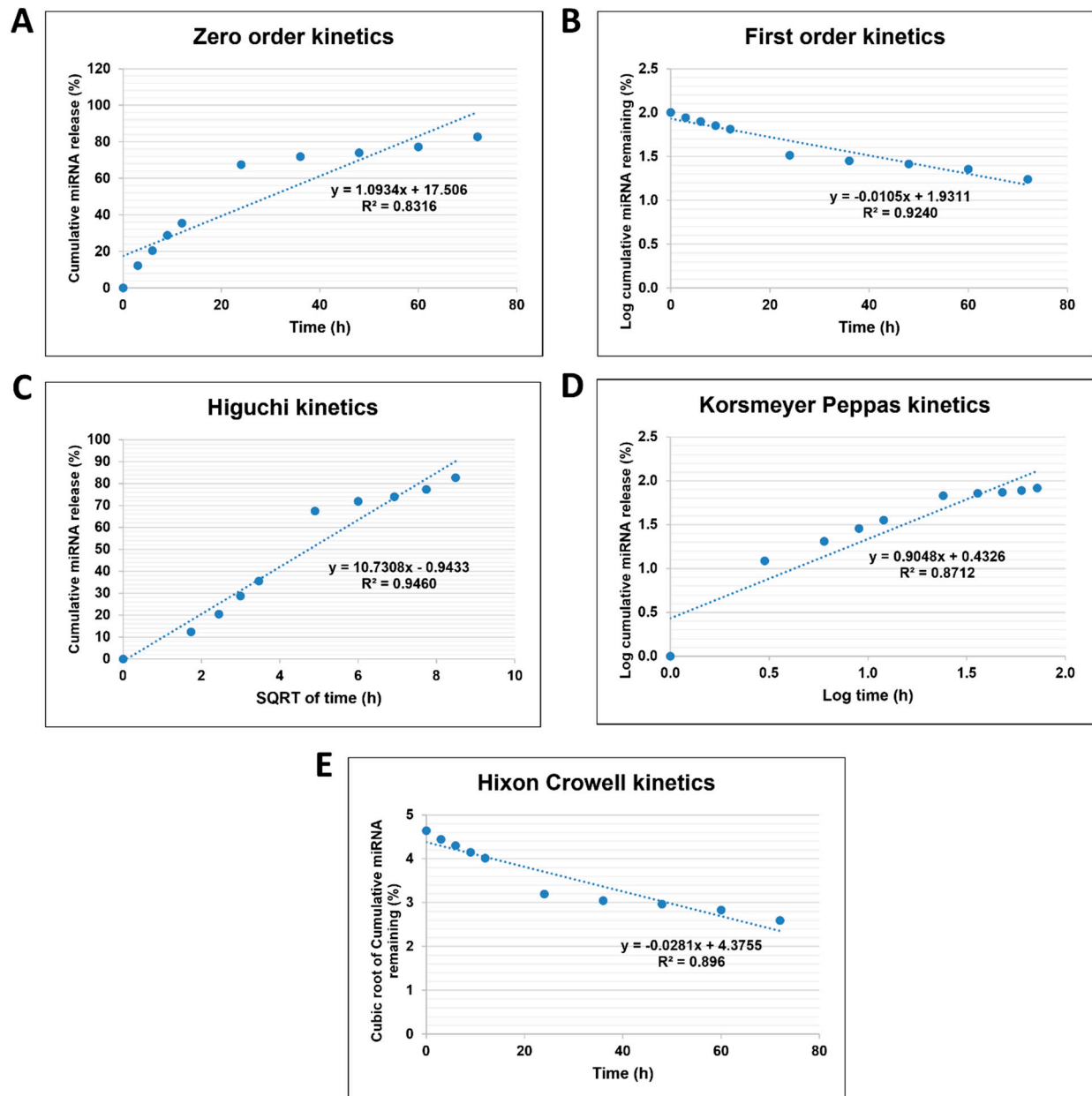


Figure S11. NG/a-miR21-3 release data in pH 7.4 + 5 mM GSH fitted to (A) zero order, (B) first order, (C) Higuchi, (D) Korsmeyer Peppas, and (E) Hixon Crowell models.