Supporting Information

RNA Delivery Using a Graphene Oxide-Polyethyleneimine Hybrid Inhibiting Myotube Differentiation

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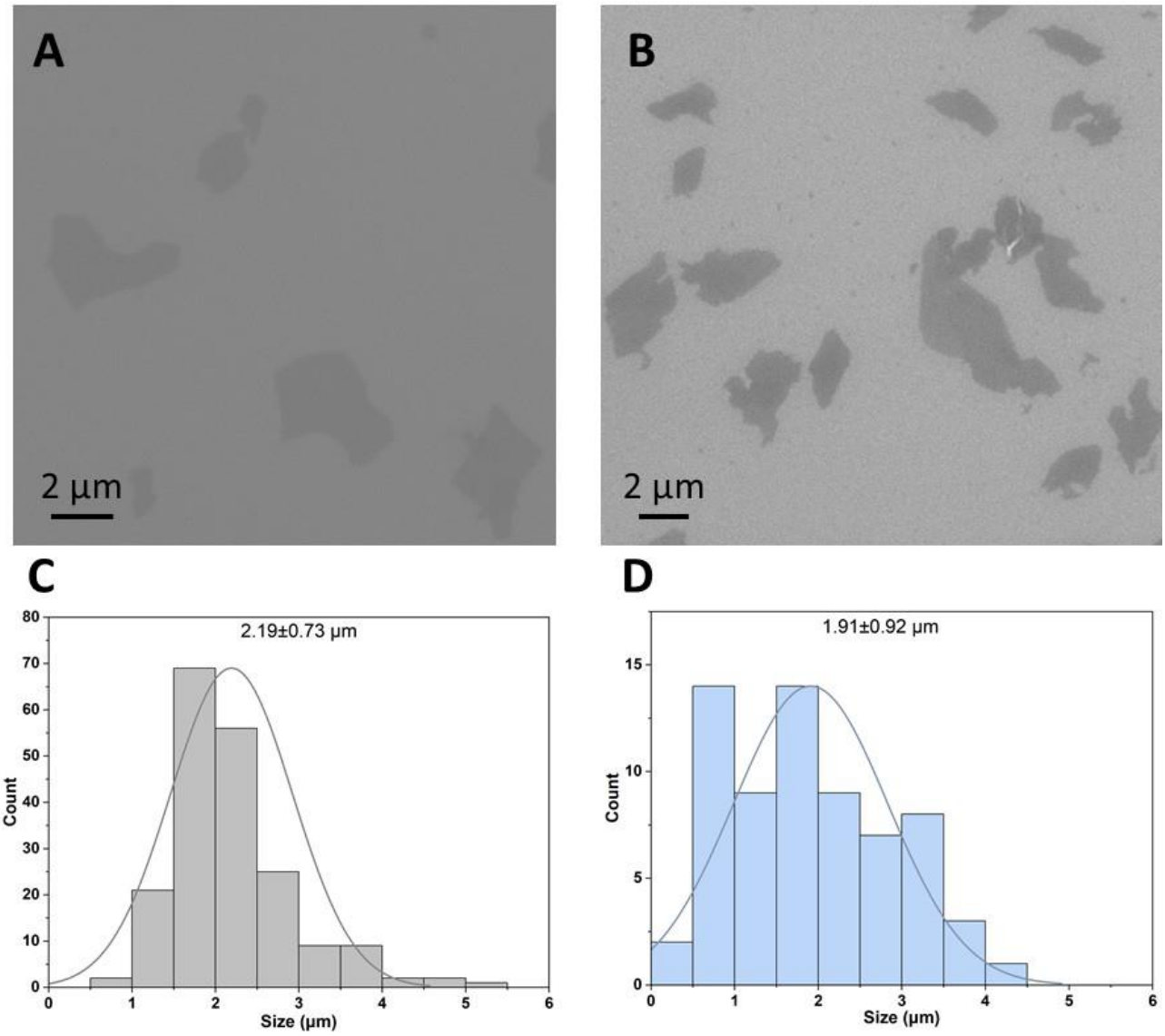

Figure S1. Representative SEM images of GO **(A)** and GO-PEI **(B)**, and lateral size distribution of GO **(C)** and GO-PEI **(D)**, measuring 67 and 198 sheets respectively.

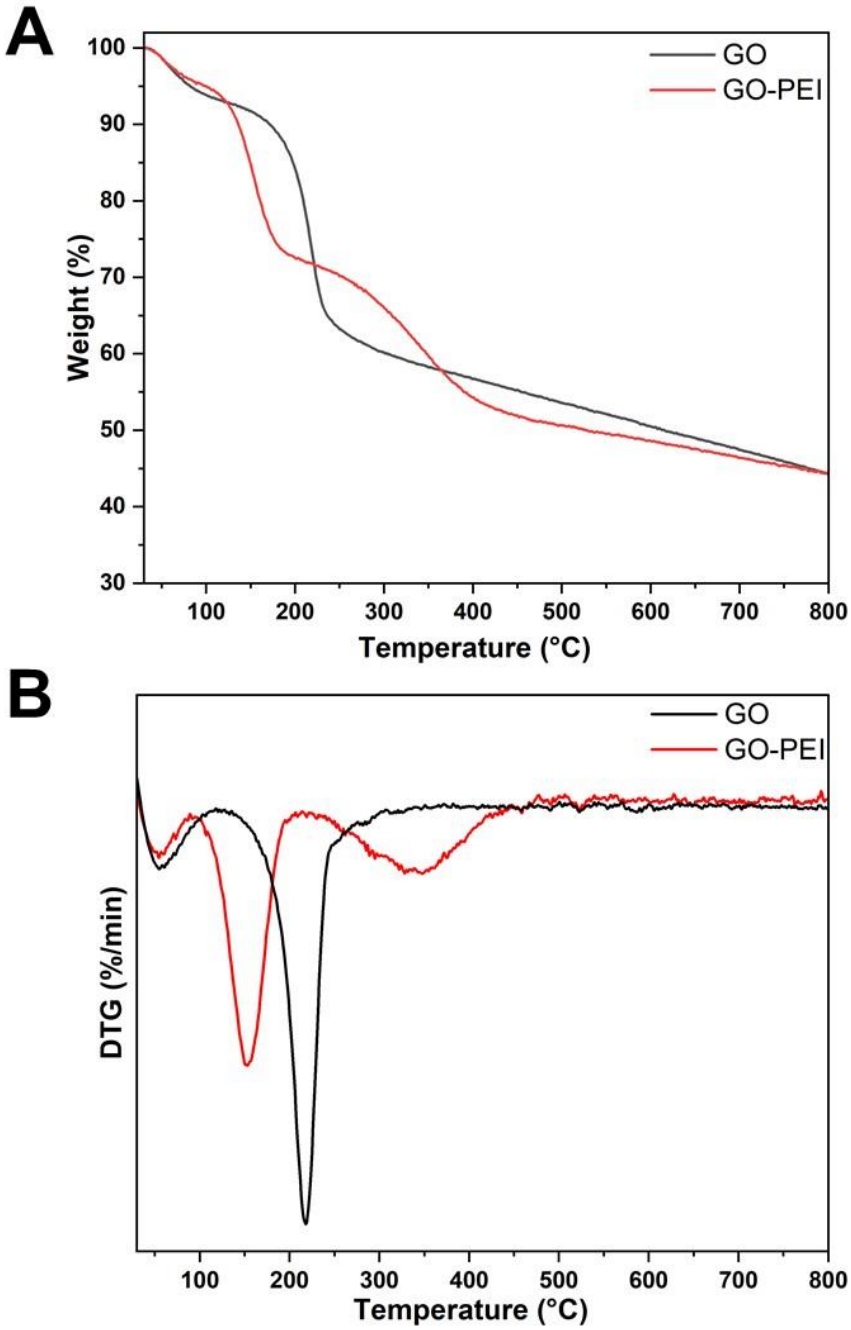

Figure S2. TGA **(A)** and DTG **(B)** curves of GO and GO-PEI.

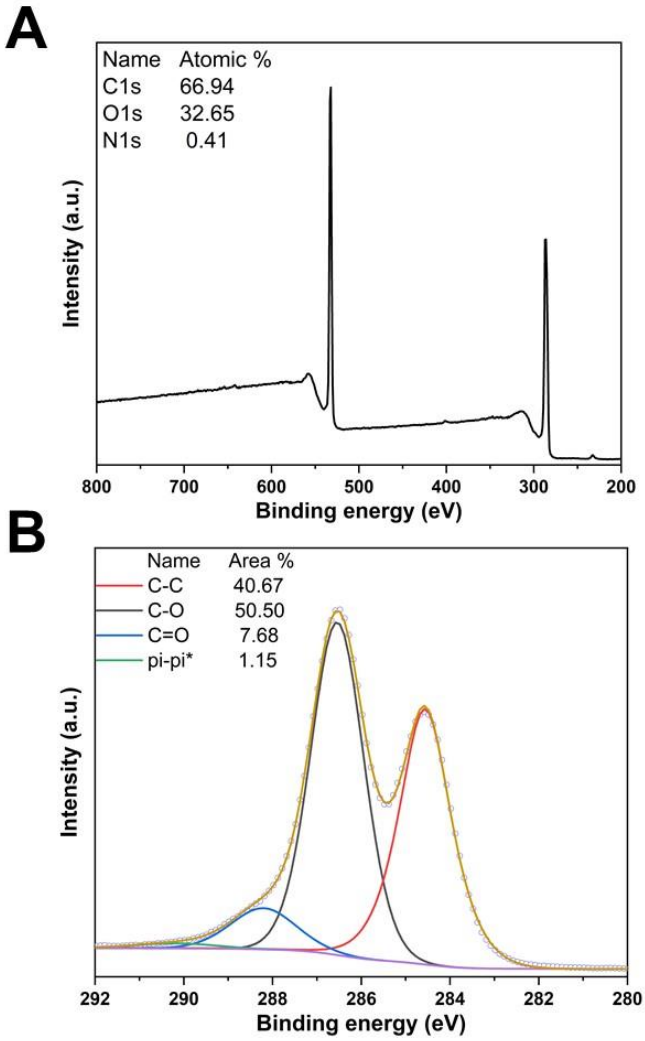

Figure S3. XPS survey spectrum of GO **(A)**, and high-resolution C 1s spectrum of GO **(B)**.

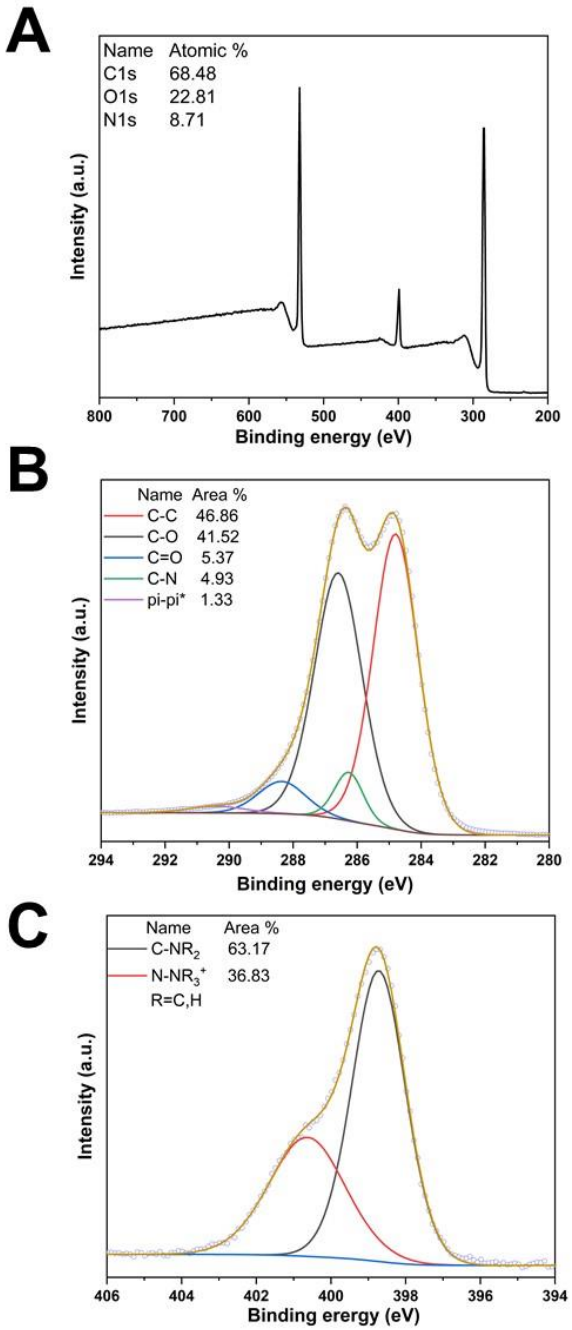

Figure S4. XPS survey spectrum of GO-PEI **(A)**, high-resolution C 1s spectrum of GO-PEI **(B)**, and high-resolution N 1s spectrum of GO-PEI **(C)**.

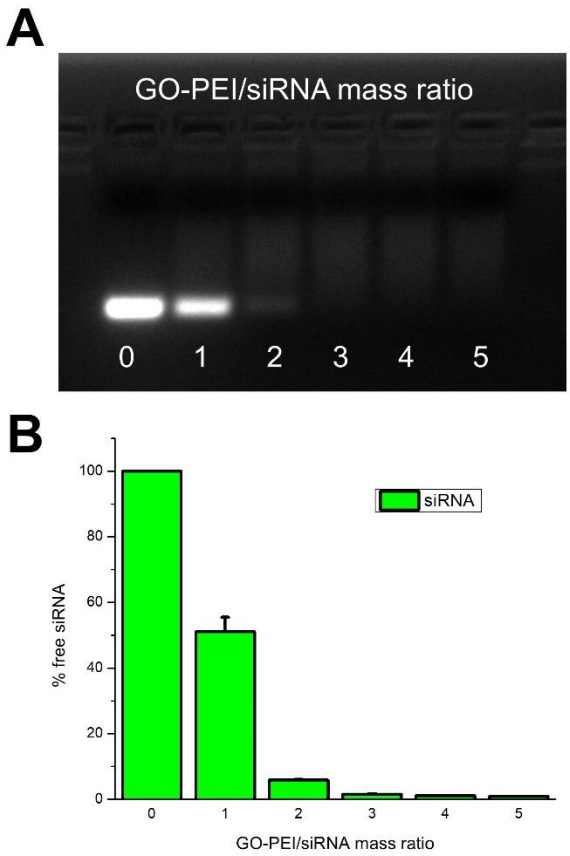

Figure S5. Complexation of GO-PEI with siRNA. **(A)** Image of agarose gel electrophoresis of GO-PEI/siRNA. **(B)**, Histograms showing the free siRNA signal intensity at different GO-PEI/siRNA mass ratios.

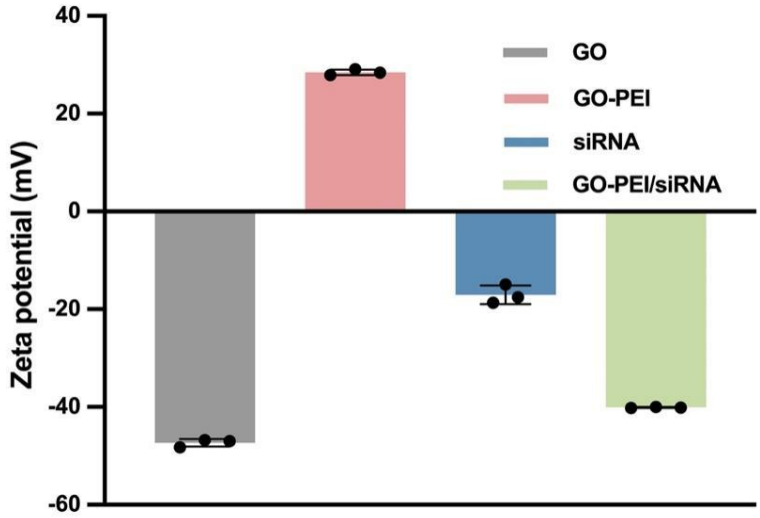

Figure S6. Zeta potential of GO, GO-PEI, siRNA and GO-PEI/siRNA (1:1).

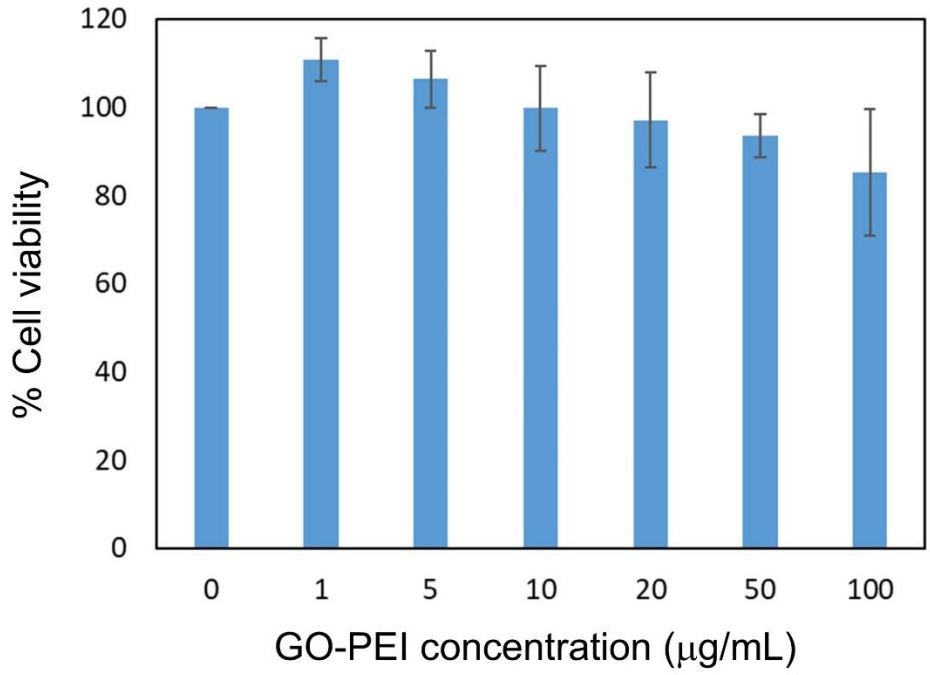

Figure S7. C2C12 cell viability analysis using AlamarBlue assay at different GO-PEI concentration. Error bars are standard deviation (S.D.) of independent experiments (N=3~5). Significant difference with the averages was analyzed by one-way ANOVA (*P<0.05). The Dunnett method compares each group with the control group (0 μg/mL). No significant difference between all other groups with the control was found.

Table S1. dsRNA sequences used on the siRNA experiments.

dsRNA code	RNA sequences (sense strand only)	CDS position
	RNAi positive	
1	AGGUGUGUAAGAGGAAGUC	264-282
2	ACCAUGCCCAACUGAGAUU	713-731
	Scrambled negative control	
S1	GUUAAGGCGGUGAAUGAGA	
S2	GAAUCAGUUCCGAUCCACA	

Table S2. Primer sequences for the qPCR experiments.

	Myogenin
Forward	CATCCAGTACATTGAGCGCCTA
Reverse	GAGCAAATGATCTCCTGGGTTG
	Beta-actin (house keeper-gene)
Forward	TTGCTGACAGGATGCAGAAG
Reverse	GTACTTGCGCTCAGGAGGAG

Table S3. Comparison of our and previous GO-PEI hybrids as RNA transfection materials.

Type of RNA	Type of GO functionalization	Average size (nm)	ζ-potential (mV)	Cell types or animals	Purpose of the transfection	Ref.*
mRNA	Non-covalent interaction	205	+26.7	Adipose tissue-derived fibroblasts	Induction of pluripotent stem cells	1 (22)
mRNA	Non-covalent interaction	220	–	DC2.4, RAW264.7, B16-OVA cells/mice	Release of ovalbumin encoding mRNA	2 (23)
siRNA	Amide bond formation	~200	+55.5	HeLa cells	Anticancer drug transfection	3 (24)
siRNA	Amide bond formation	~200	+27.4	Human blast carcinoma	Suppression of breast cancer	4 (25)
miRNA	Amide bond formation	174	–	HuCCT1/mice	Inhibition of intrahepatic cholangial carcinoma	5 (26)
siRNA	Epoxide ring opening reaction	1910	+28.5	C2C12	Myogenic silencing	This work

*The numbers in parentheses indicate the number of the reference in the main manuscript.

References

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