ADVANCED FUNCTIONAL MATERIALS

Supporting Information

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In Vitro Prostate Cancer Treatment via CRISPR-Cas9 Gene Editing Facilitated by Polyethyleneimine-Derived Graphene Quantum Dots

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Supporting Information

Figure S1. Fluorescence upon UV illumination (top) and suspension colors (bottom) for different batches of PEI-GQD after the synthetic times of 5, 10, 20, 30, 40, and 50 min in a microwave-assisted hydrothermal reaction.

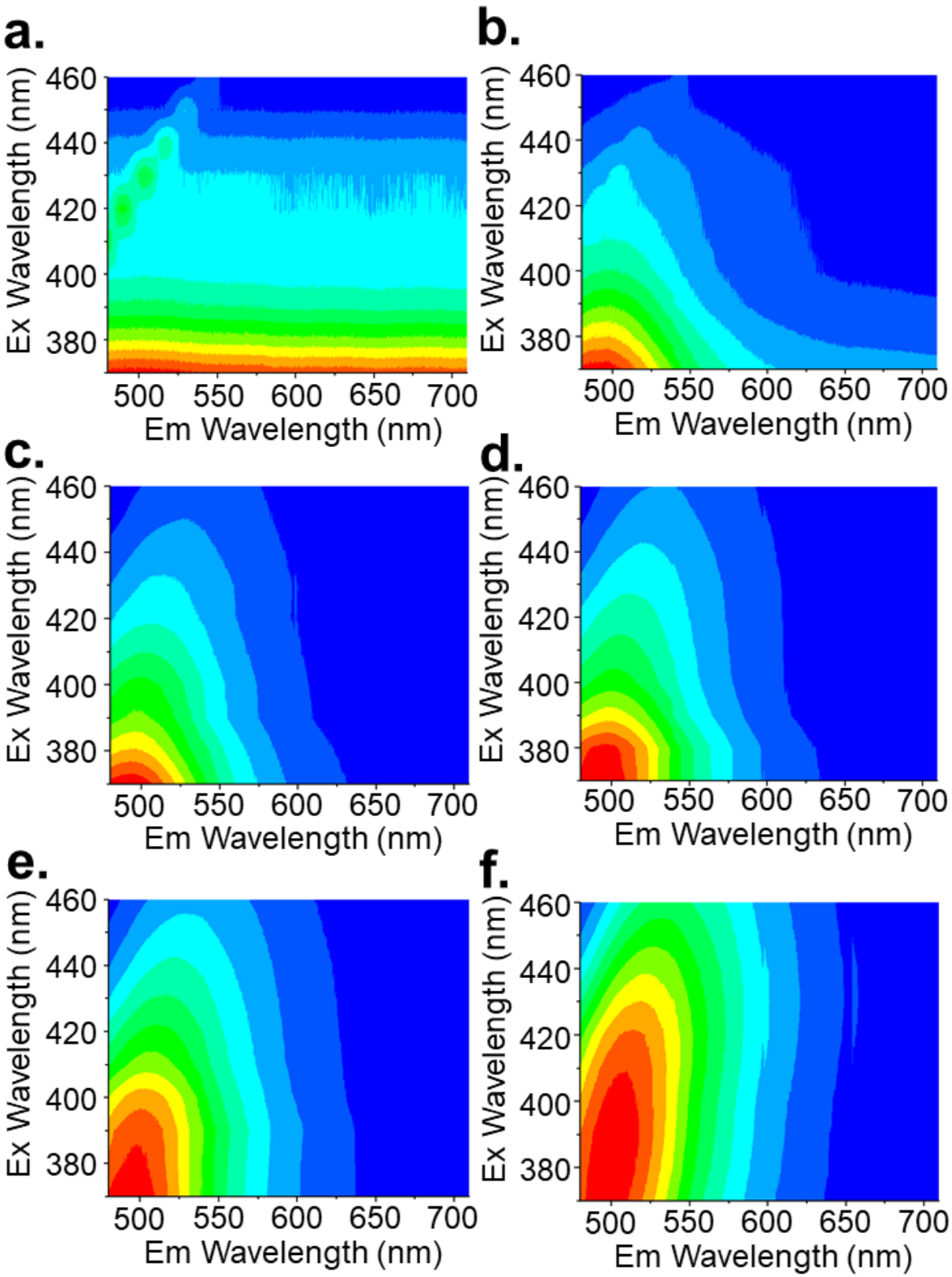


Figure S2. Excitation-emission maps of PEI-GQDs synthesized at different reaction times of (a) 5 min, (b) 10 min, (c) 20 min, (d) 30 min, (e) 40 min, and (f) 50 min.

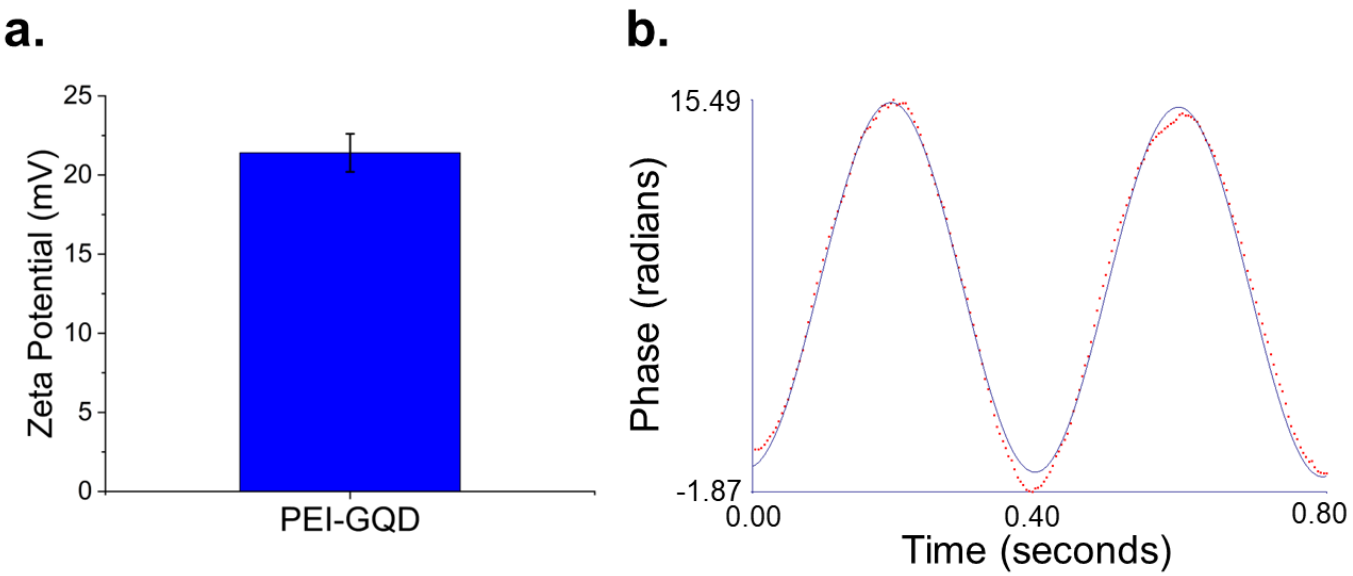


Figure S3. (a) Zeta potential of PEI-GQD (21.4 ± 1.2 mV) (mean ± SE, n = 10) and (b) Zeta potential phase analysis of PEI-GQDs.

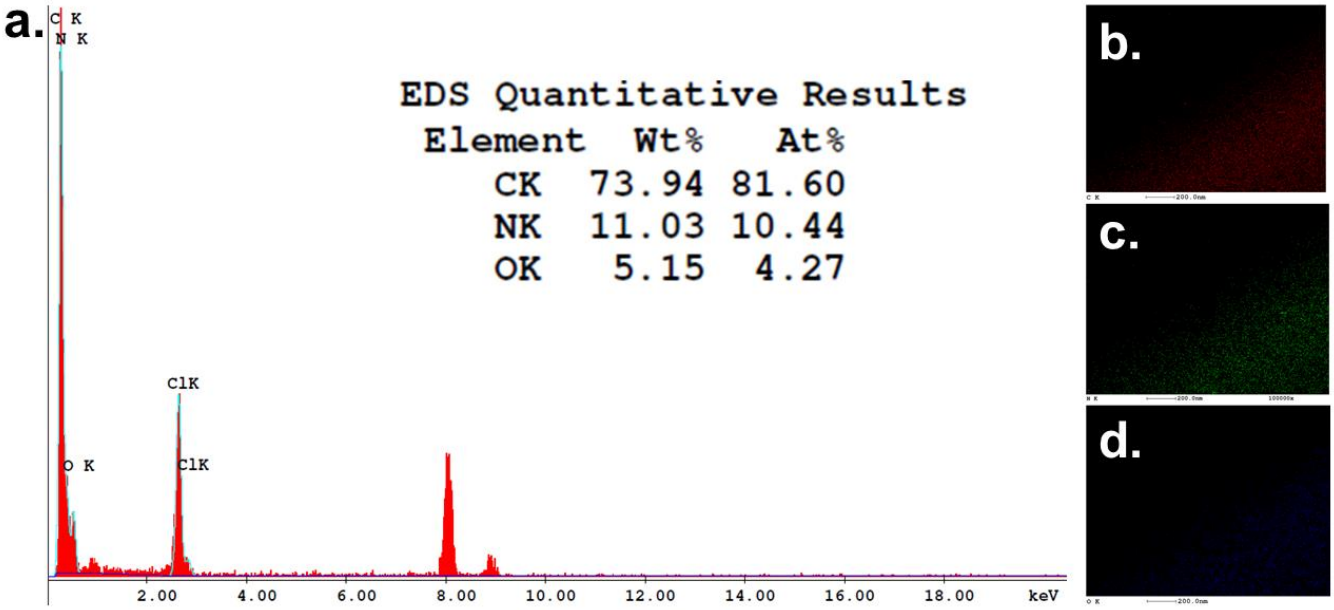
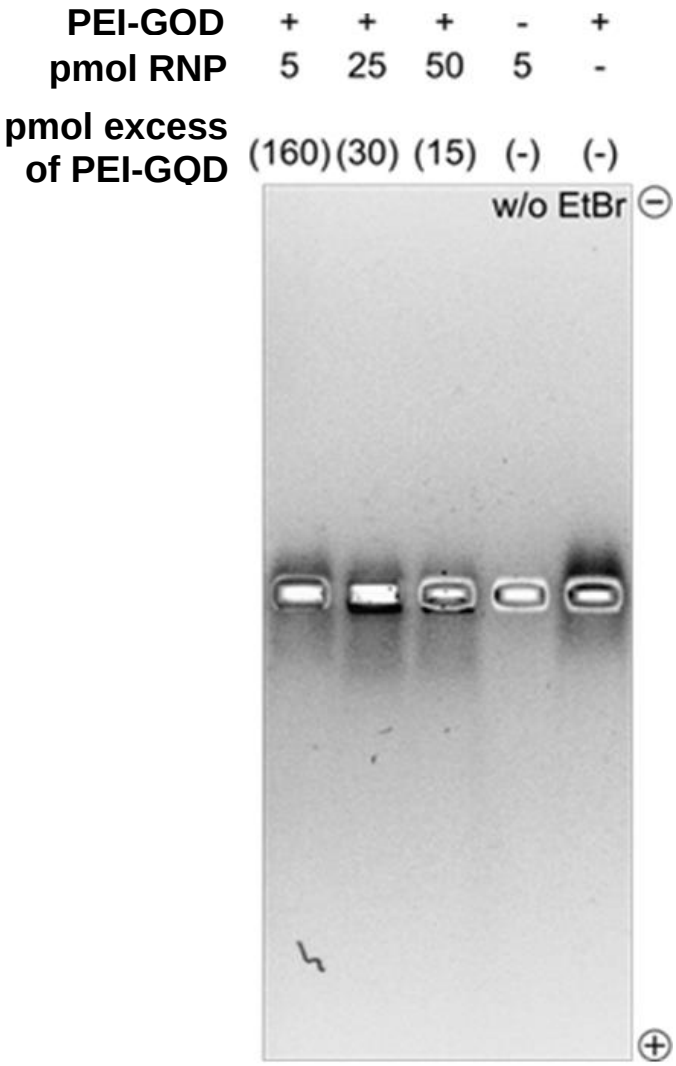


Figure S4. (a) EDS spectrum of PEI-GQDs. Inset: Atomic weight percentage of carbon, nitrogen, and oxygen. Elemental maps of PEI-GQDs for (b) carbon, (c) nitrogen, and (d) oxygen in the region containing PEI-GQDs.

Figure S5. Gel retardation assay testing the complexation of positively charged PEI-GQDs with negatively charged RNP. From left to right, the molar excess of PEI-GQDs to RNP is 160, 30, and 15, along with only RNP and PEI-GQDs in the last gel lanes. The gel has not been stained with ethidium bromide.



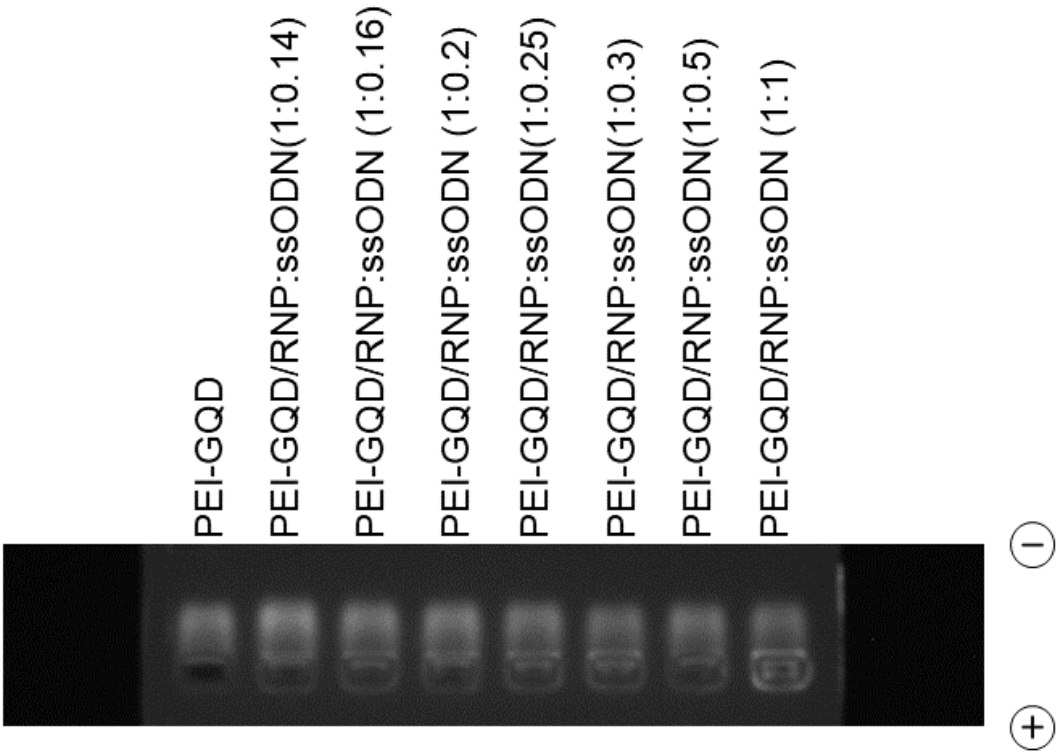


Figure S6. Gel retardation assay of PEI-GQDs loaded with RNP, and ssODN repair template. Different molar ratios of RNP and ssODN repair template (1:0.14, 1:0.16, 1:0.2, 1:0.25, 1:0.3, 1:0.5, and 1:1) have been tested.

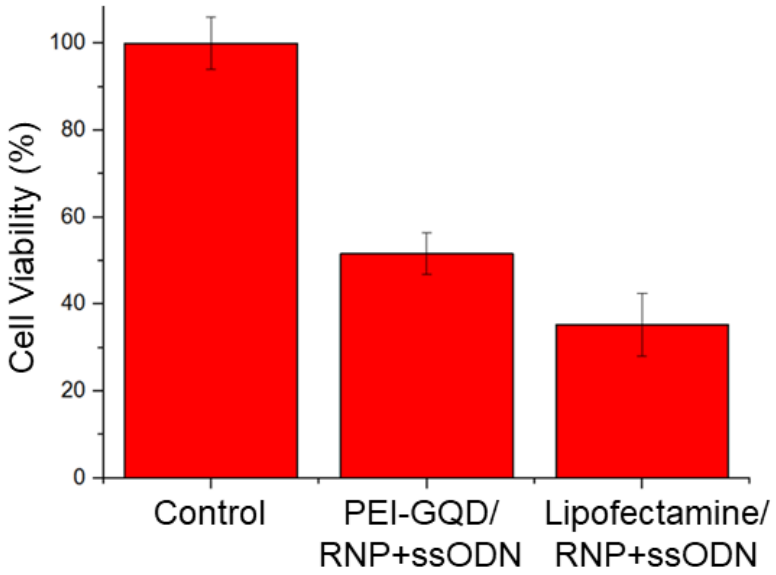


Figure S7. Analysis of PC-3 cancer cell death after the treatment with PEI-GQD/RNP+ssODN and Lipofectamine/RNP+ssODN. Percent cell viability of PC-3 cells assessed via stained dead cell count (mean ± SE, n = 4).

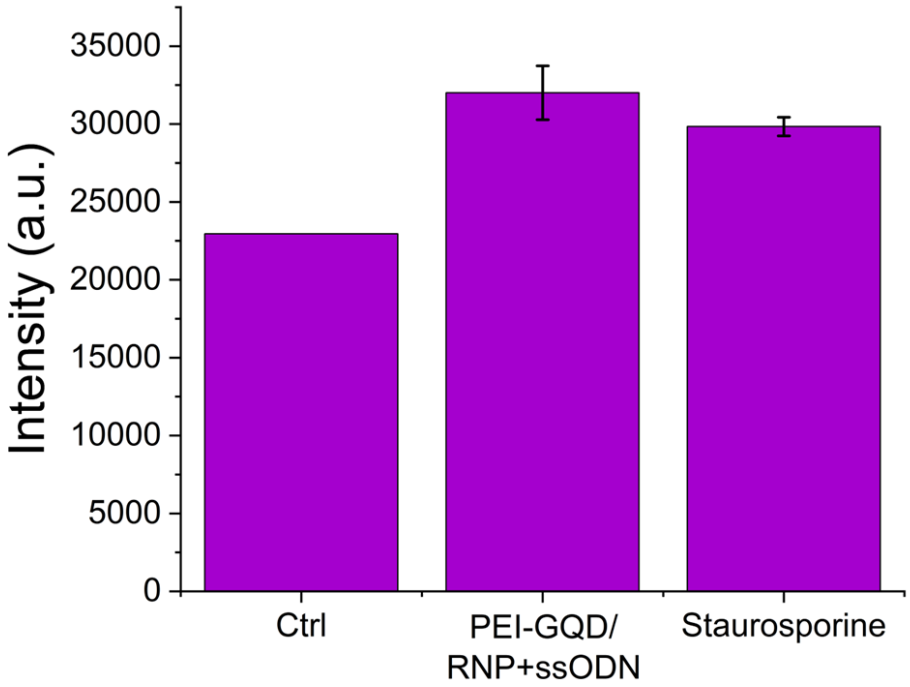


Figure S8. Level of caspase activity based on luminescence intensity using the Caspase-3/7 assay (mean ± SE, n = 2).