Supporting Information

Antimicrobial Activity of Graphene Oxide Quantum Dots: Impacts of Chemical Reduction

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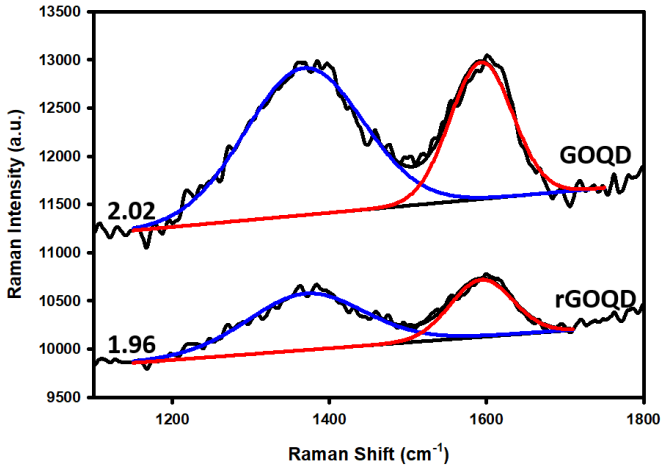

Figure S1. Raman spectra of GOQD and rGOQD. D/G ratios in terms of integrated peak area are given above each fitting.

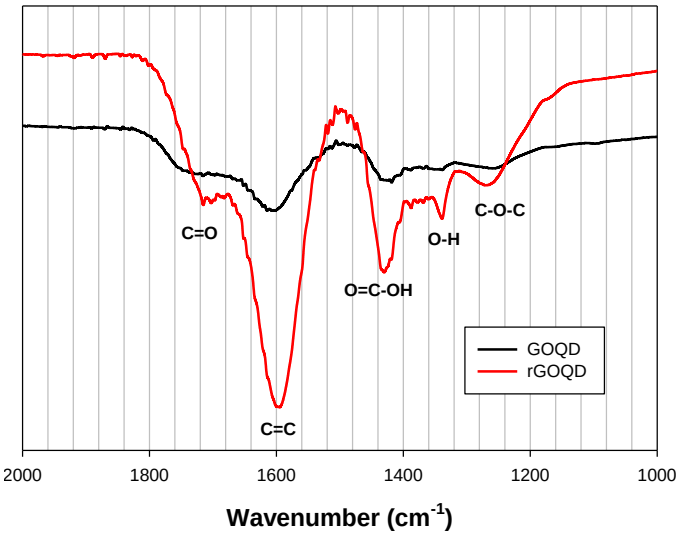

Figure S2. FTIR Spectra of GOQD and rGOQD.

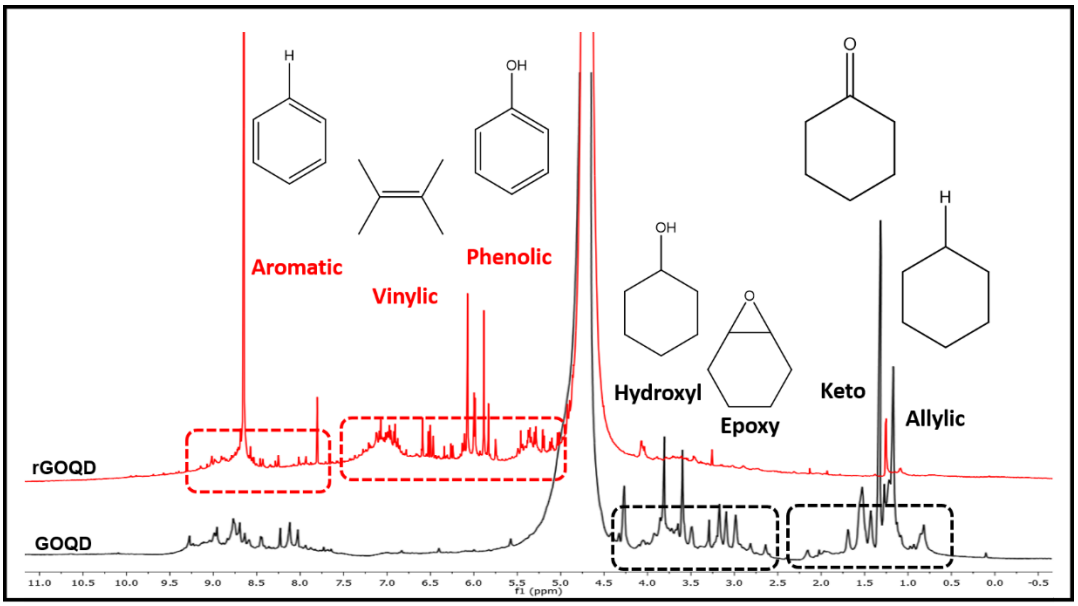

Figure S3. ^{1}H NMR spectra of GOQD and rGOQD. Regions with functional groups of interest are highlighted and their assignments noted above. One can see that the aromatic =C-H signals are markedly stronger with the rGOQD sample than with the GOQDs, suggesting formation of an increasing fraction of sp^2 carbon in the carbon matrix.

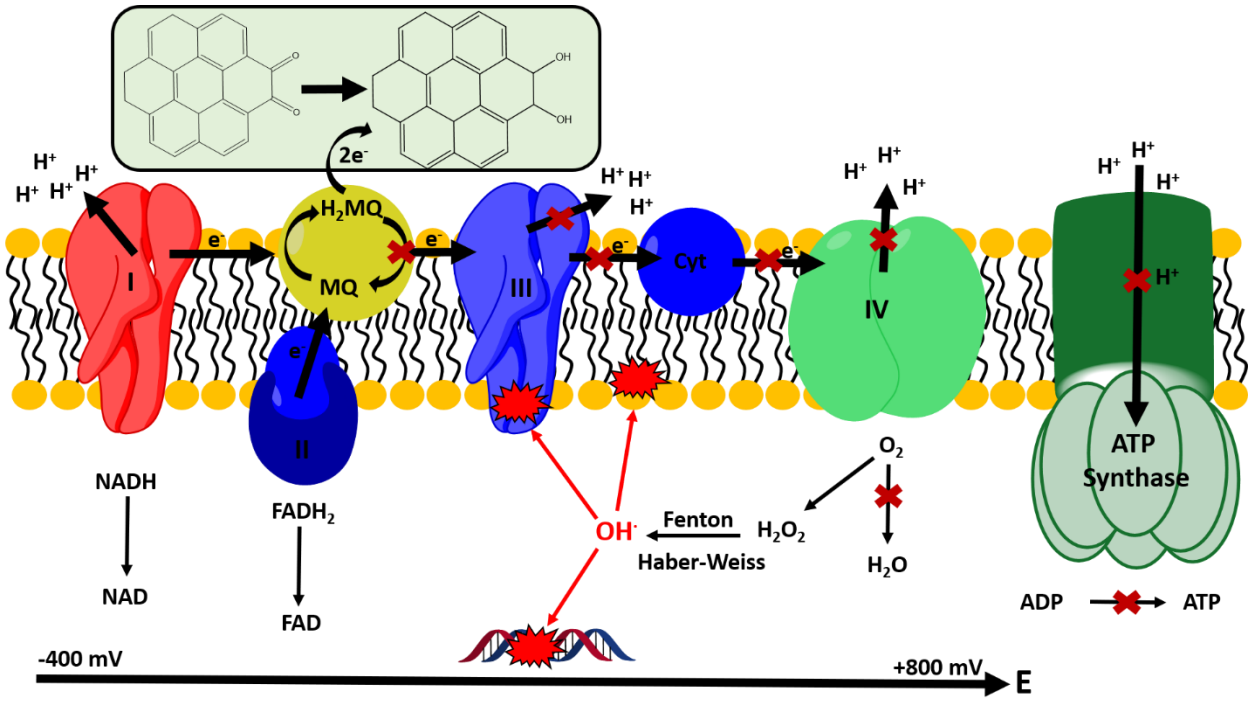

Figure S4. Proposed mechanism of cytotoxicity by phenanthroquinone-like moieties.

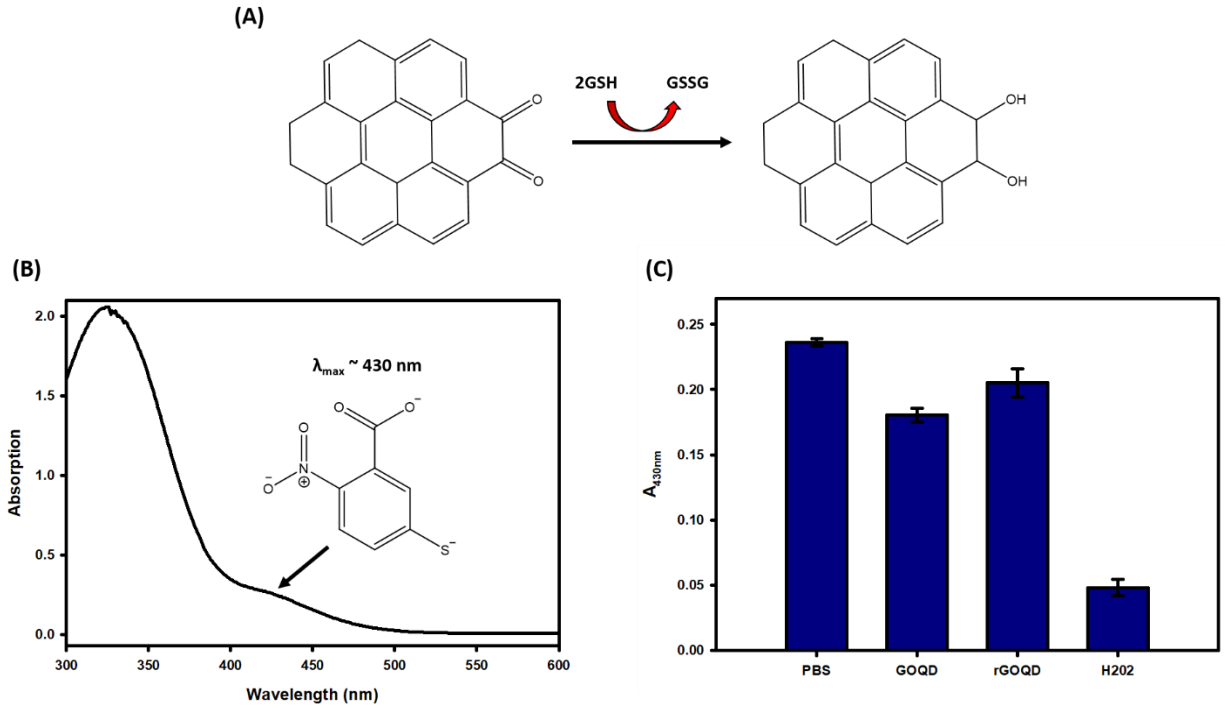

Figure S5. Ellman's assay with GOQD and rGOQD. (A) Proposed mechanism of glutathione (GSH) oxidation by phenanthroquinone moieties. (B) Representative UV-vis spectra of the PBS control highlighting the absorption band originating from DNB^{2-}. (C) Bar chart of the absorbance at 430 nm after incubation with PBS (pH=7.4), H_2O_2, GOQD, and rGOQD solutions for 30 min.

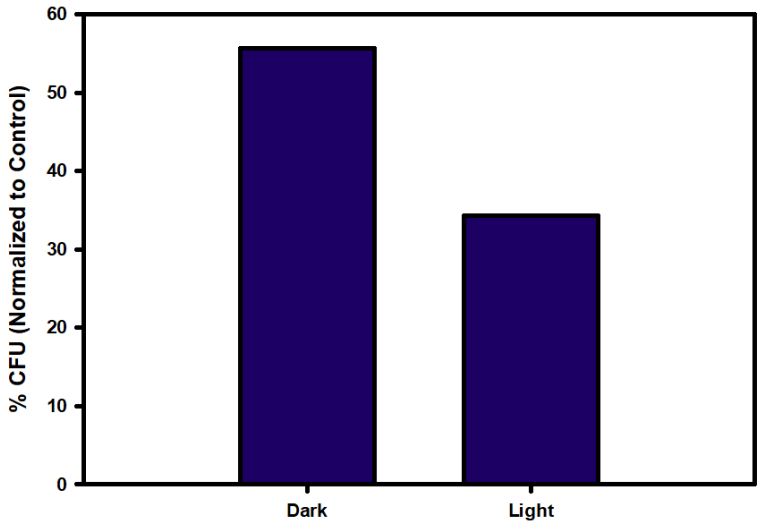

Figure S6. Comparison of viability changes of cells suspended in 1 mg/mL GOQD solution after 3 min in the dark and under photoirradiation.

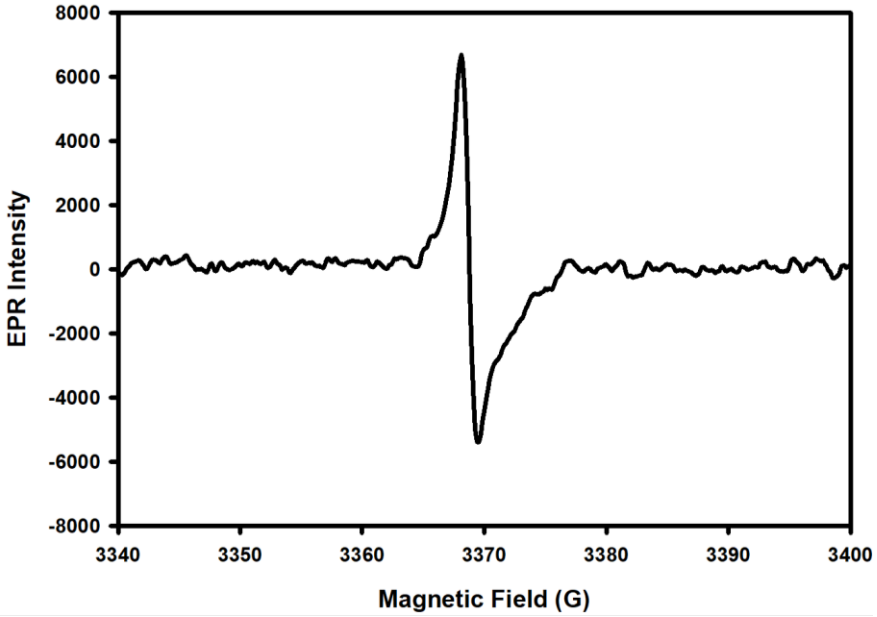

Figure S7. EPR spectrum of GOQD in water (1 mg/mL) in the absence of DMPO.

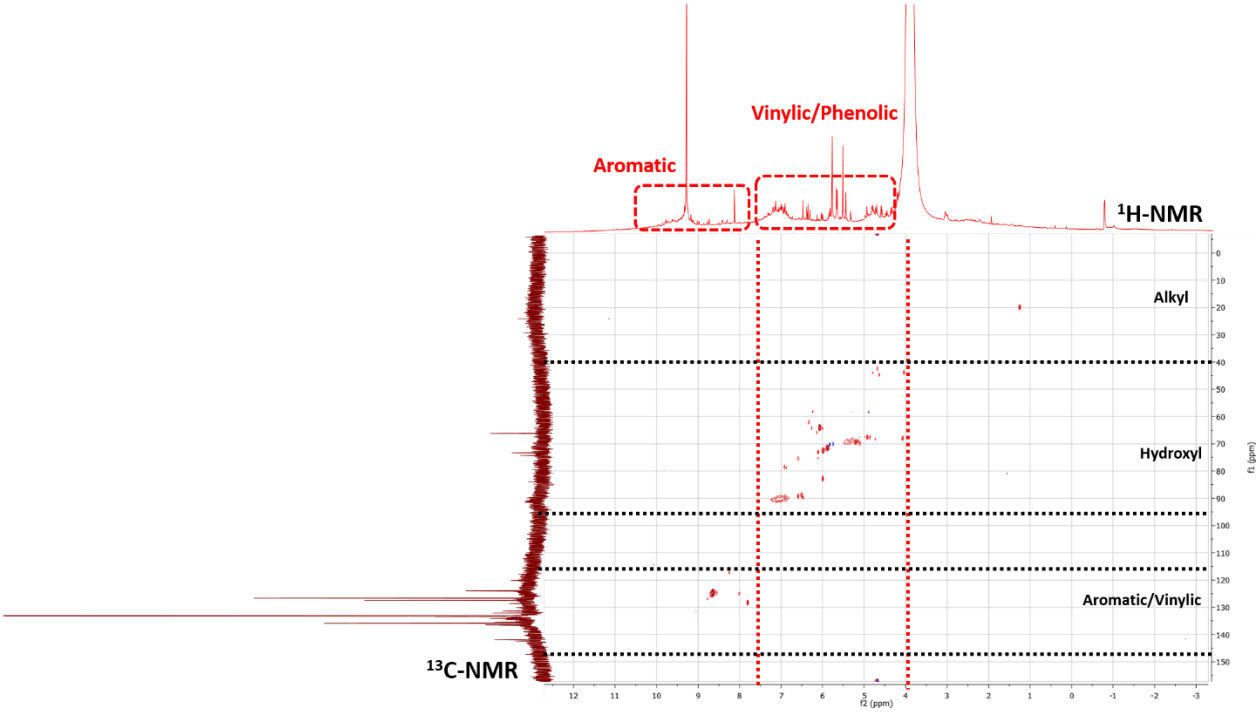

Figure S8. ^{13}C-^{1}H HSQC spectrum for rGOQD. Relevant functional groups are highlighted in both ^{1}H NMR and ^{13}C NMR spectra, and dotted lines show the correlation regions.

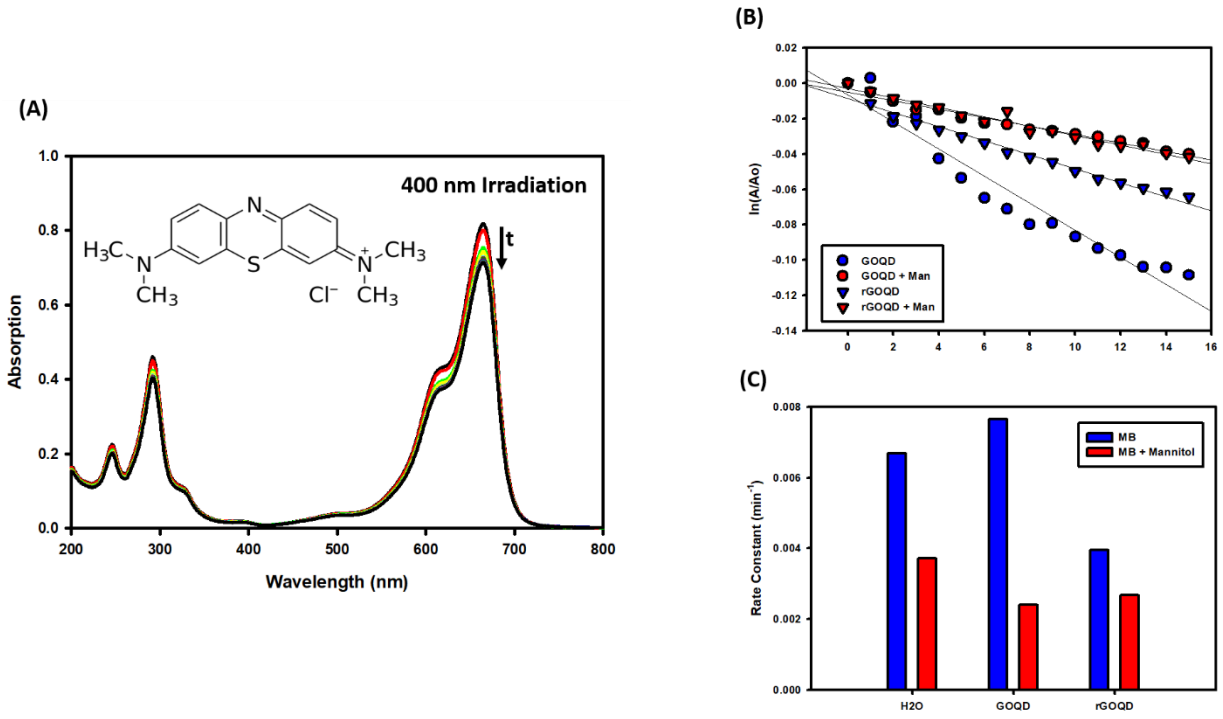

Figure S9. Methylene blue photocatalytic degradation in the presence of GOQD and rGOQD solutions. (A) Absorption spectra during photocatalytic degradation over a 15 min time period. (B) Plots of $\ln(A/A_o)$ vs time, where slopes of the linear regression yield the degradation rate constants (k_{deg}), and (C) comparison of the values of k_{deg} in methylene blue and methylene blue + 10 mM mannitol solutions catalyzed in the absence and presence of GOQD and rGOQD.