

Supplementary Data

Multifunctional Chitosan Magnetic-Graphene (CMG) Nanoparticles: a Theranostic Platform for Tumor-targeted Co-delivery of Drugs, Genes and MRI Contrast Agents

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Experimental Section

1.1. Transmission Electron Microscopy (TEM) of GO, CRGO and MG

The size distribution of GO, CRGO and MG was determined using a JEOL 1400 transmission electron microscope.

1.2 In vivo toxicity of DOX-CMG nanoparticles

To assess the potential side effects of DOX-CMG nanoparticles, body weight changes were monitored after treatment. Nine mice were randomly divided into three groups. One hundred microliter of DOX-CMG nanoparticles and DOX in PBS solution were administered intravenously (via a tail vein) to the C57BL/6 mice at 2 mg/kg of body weight (three animals/group). Control group received PBS. At different times after treatment, the animals were anesthetized and weighed.

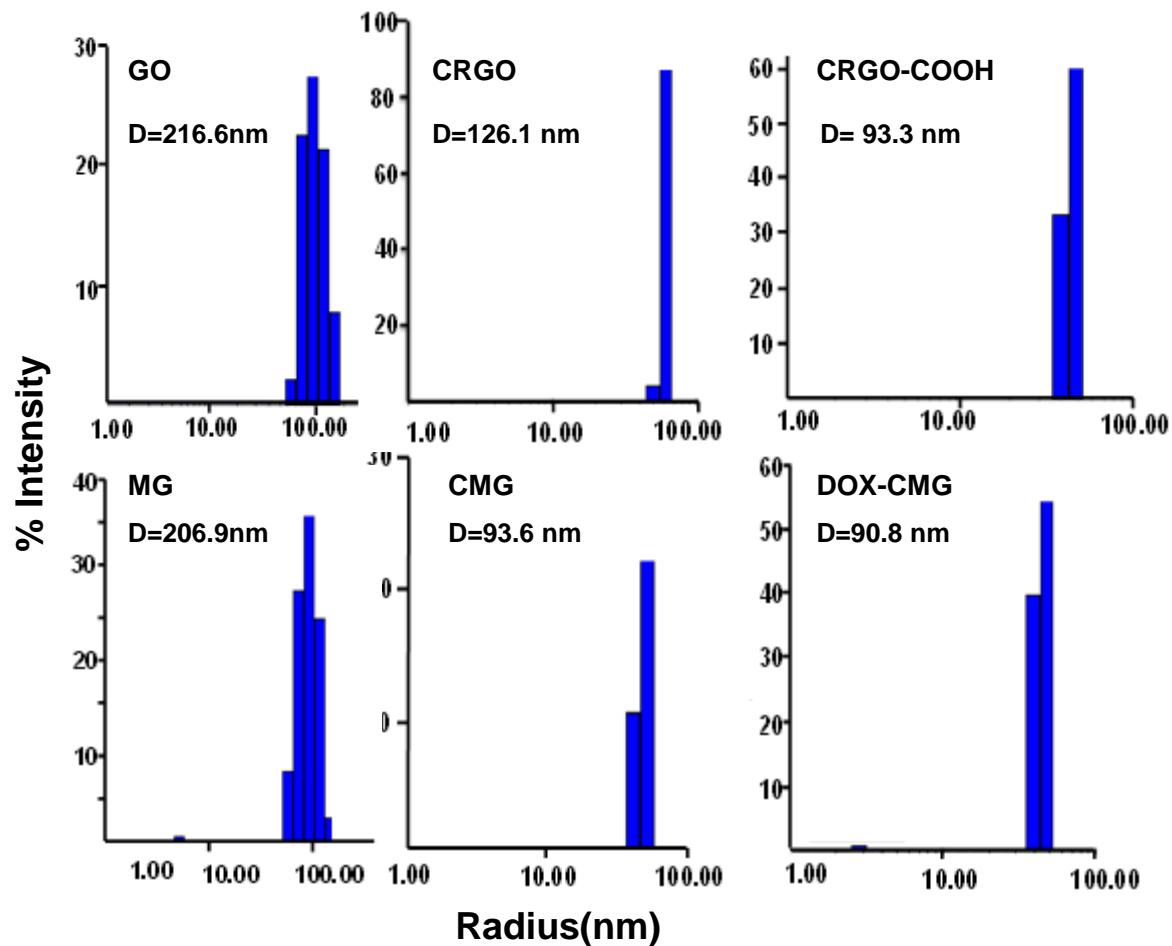


Figure S1: DLS shows the size distribution of GO, CRGO, CRGO-COOH, MG, CMG, DOX-CMG. (D, diameter)

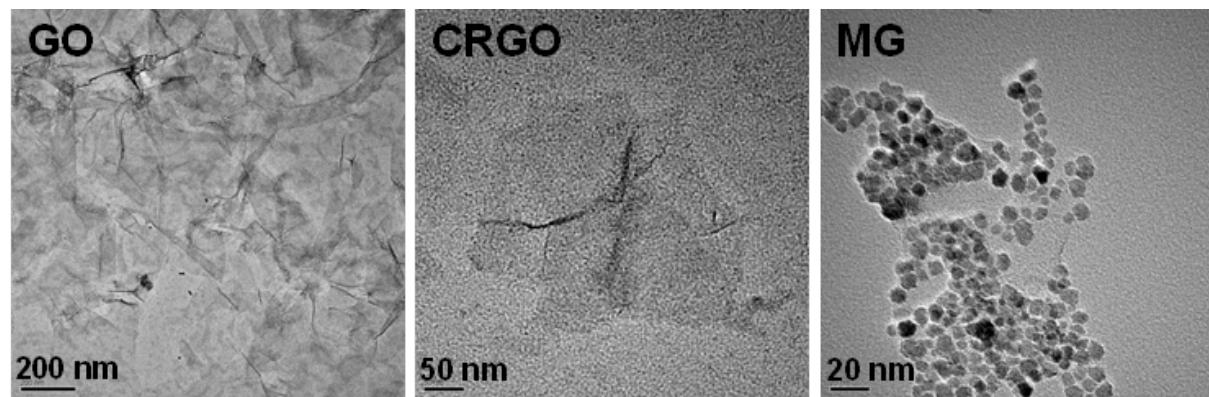


Figure S2, Transmission electron micrographs of GO, CRGO and MG

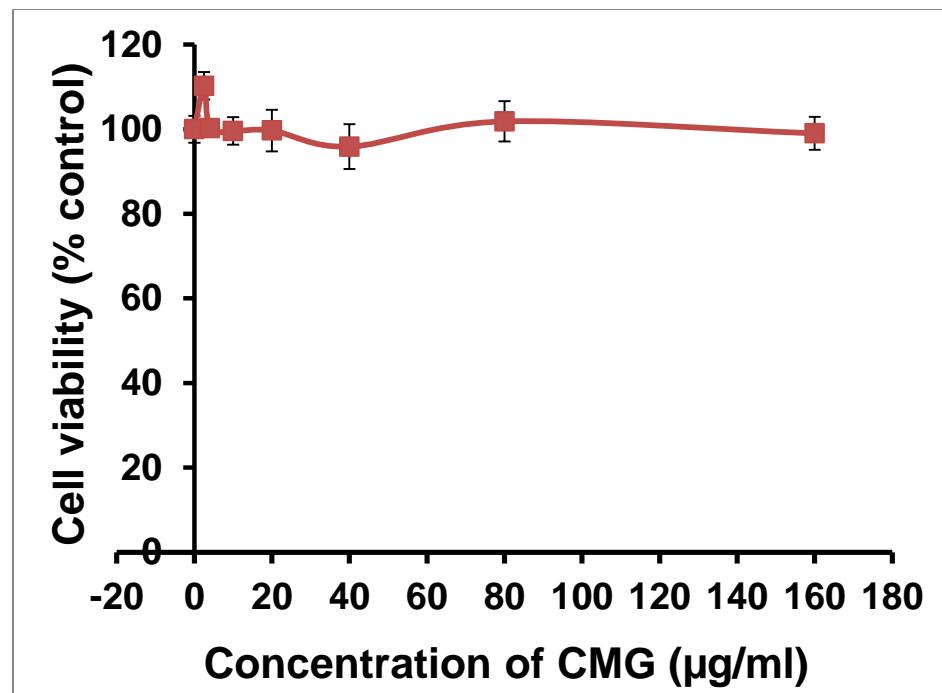


Figure S3, Viability of benign prostatic hyperplasia (BPH) cells treated with different concentrations of CMG.

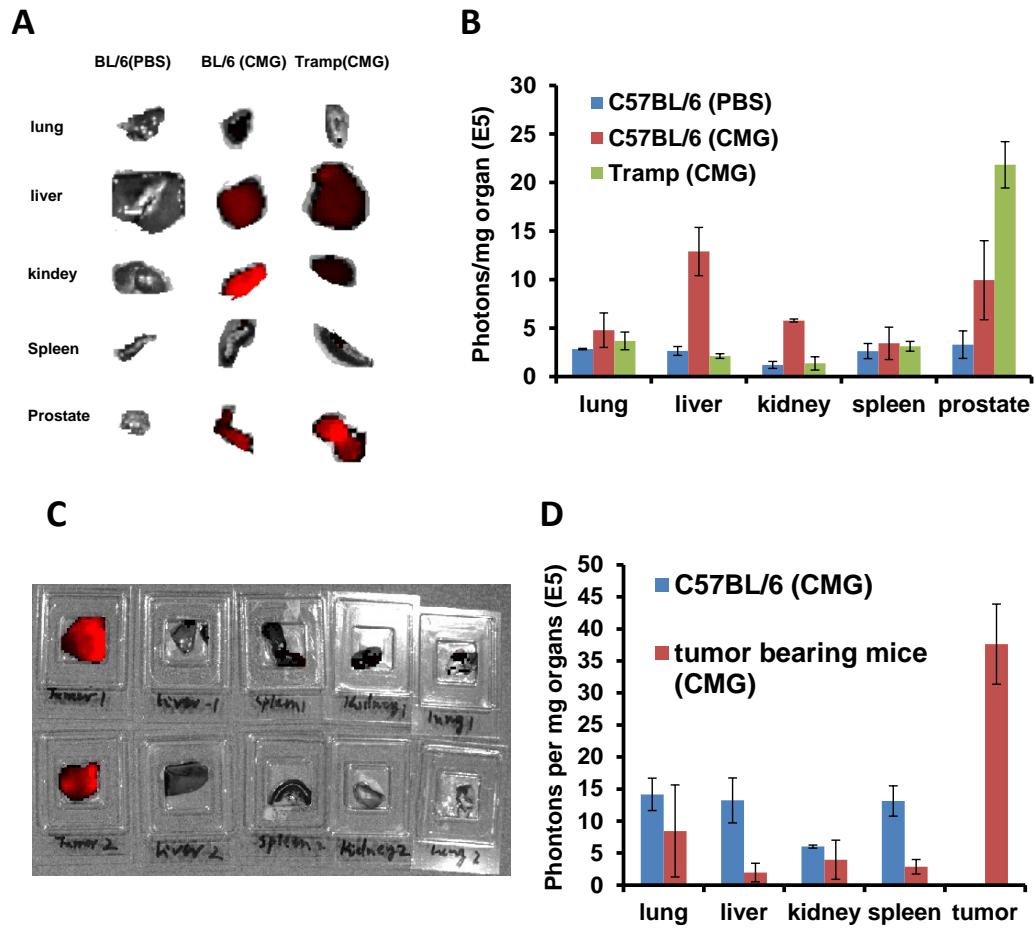


Figure S4: Biodistribution analyses of Cy5.5-CMG nanoparticles. Mice (n=2 per group) were injected i.p. with Cy5.5-CMG nanoparticles (500 μ l sample with 500 μ g CMG and 6.25 μ g Cy5.5) nanoparticles. Four hours after injection, mice were sacrificed, organs collected and fluorescence of organs was imaged via Xenogen IVIS (A & C). The average fluorescence intensity of each organ was normalized to the weight of each organ (B & D). (A-B) TRAMP mice. (C-D) LLC1 tumor-bearing mice.

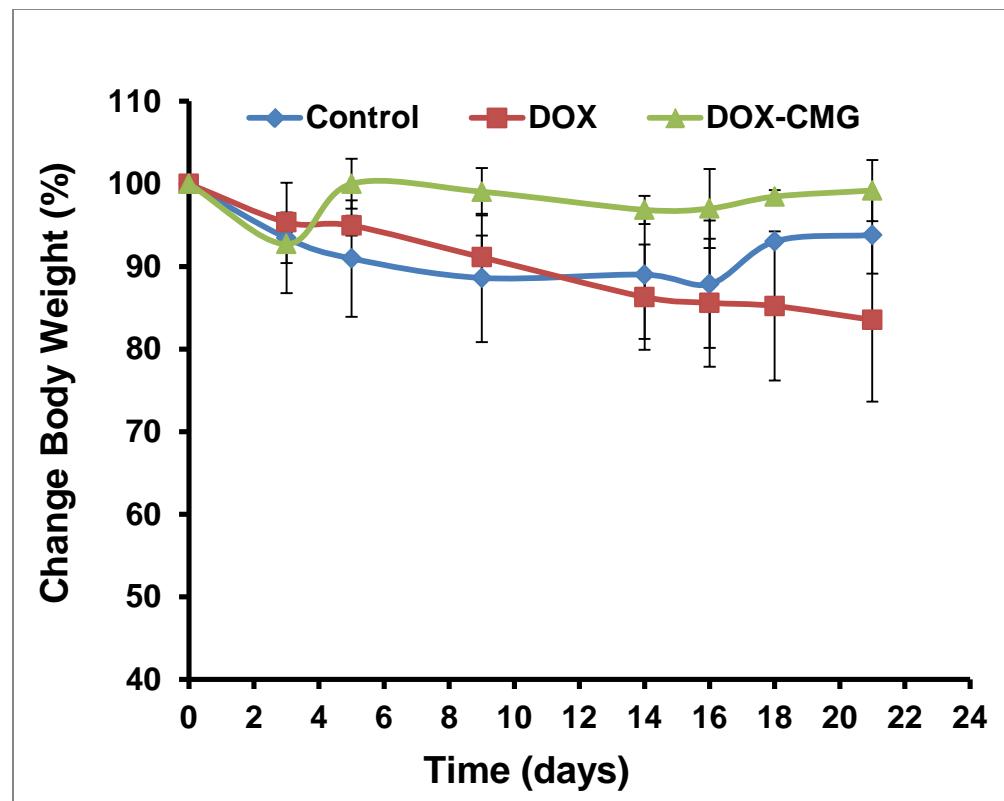


Figure S5: Percentage change in body weight with time post treatment. Body weight % = $M_t/M_0 \times 100$ where M_0 is the animal weight before injection and M_t is the animal weight at time t after injection. Each time-point represents mean \pm SD.

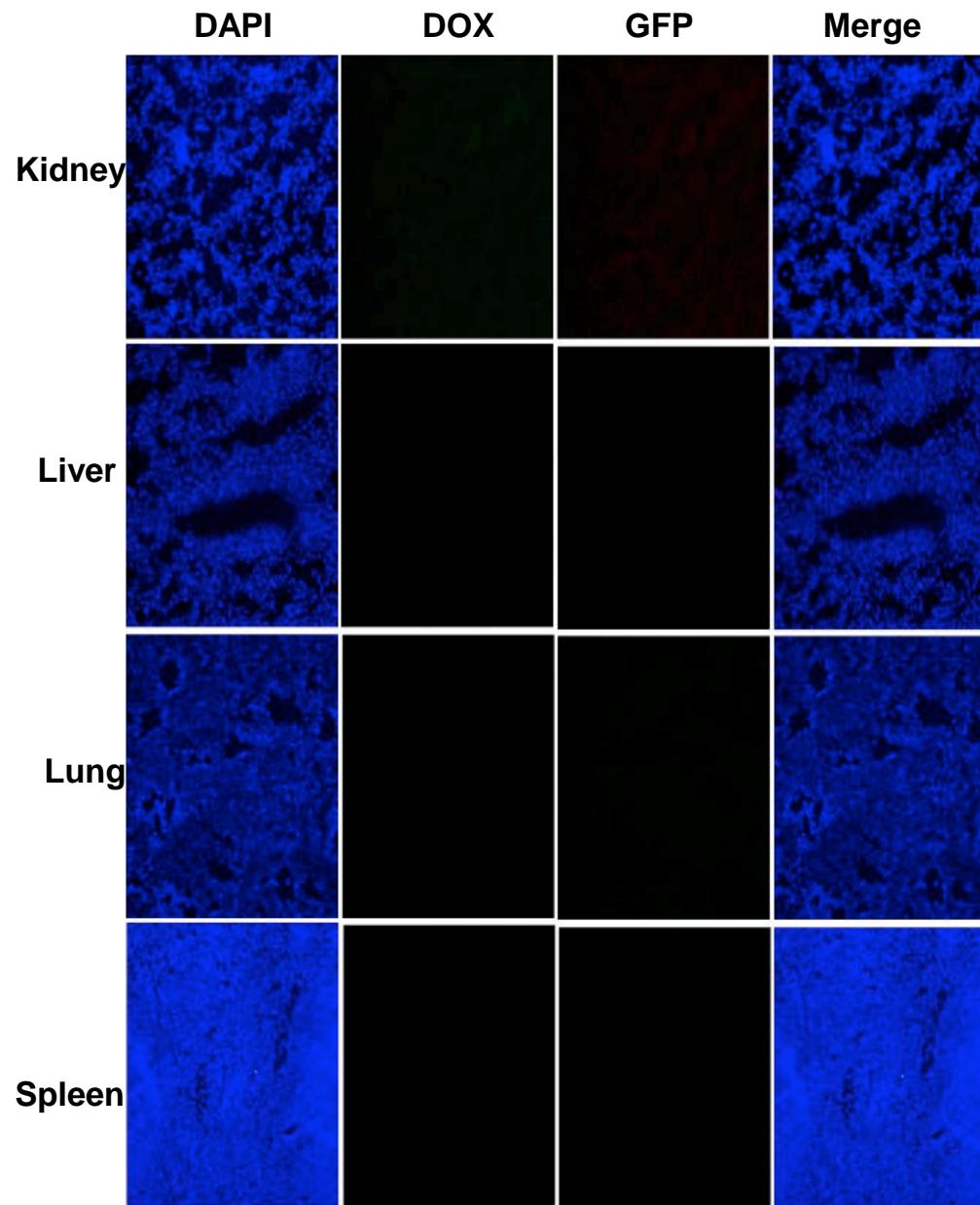


Figure S6: The represented images of DOX and GFP expression in LLC1 tumor-bearing mice. Mice (n=2 per group) were injected i.v. with DOX-CMG-GFP-DNA (30 μ g DOX and 25 μ g GFP-pDNA/mouse) nanoparticles. Twenty-four and forty-eight hours after injection, mice were sacrificed and frozen organ sections (Kidney, liver, lung, spleen) were examined for DOX and GFP. Magnification (100X).

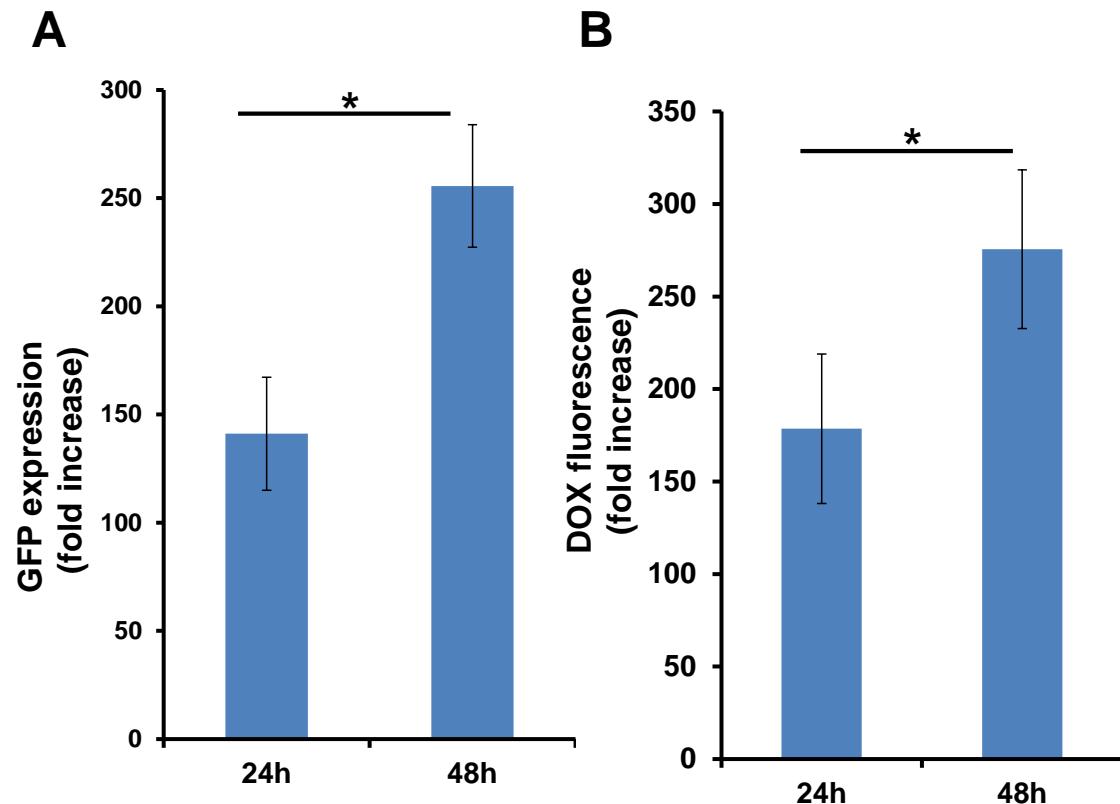


Figure S7: LLC1 tumor cells were implanted on both flanks (left and right flanks) of mice (n=2). Each mouse received a single i.p. injection of DOX-CMG-GFP-DNA. (30 μ g DOX, 25 μ g DNA/mouse, 500 μ l). 24 and 48 hrs after injection mice were sacrificed and frozen tumor sections were immunostained with anti-GFP antibody and nuclei were stained with DAPI. (A) GFP expression was normalized to the control background by image J, p<0.05 and (B) DOX fluorescence was normalized to the control background by image J, p<0.05.