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.

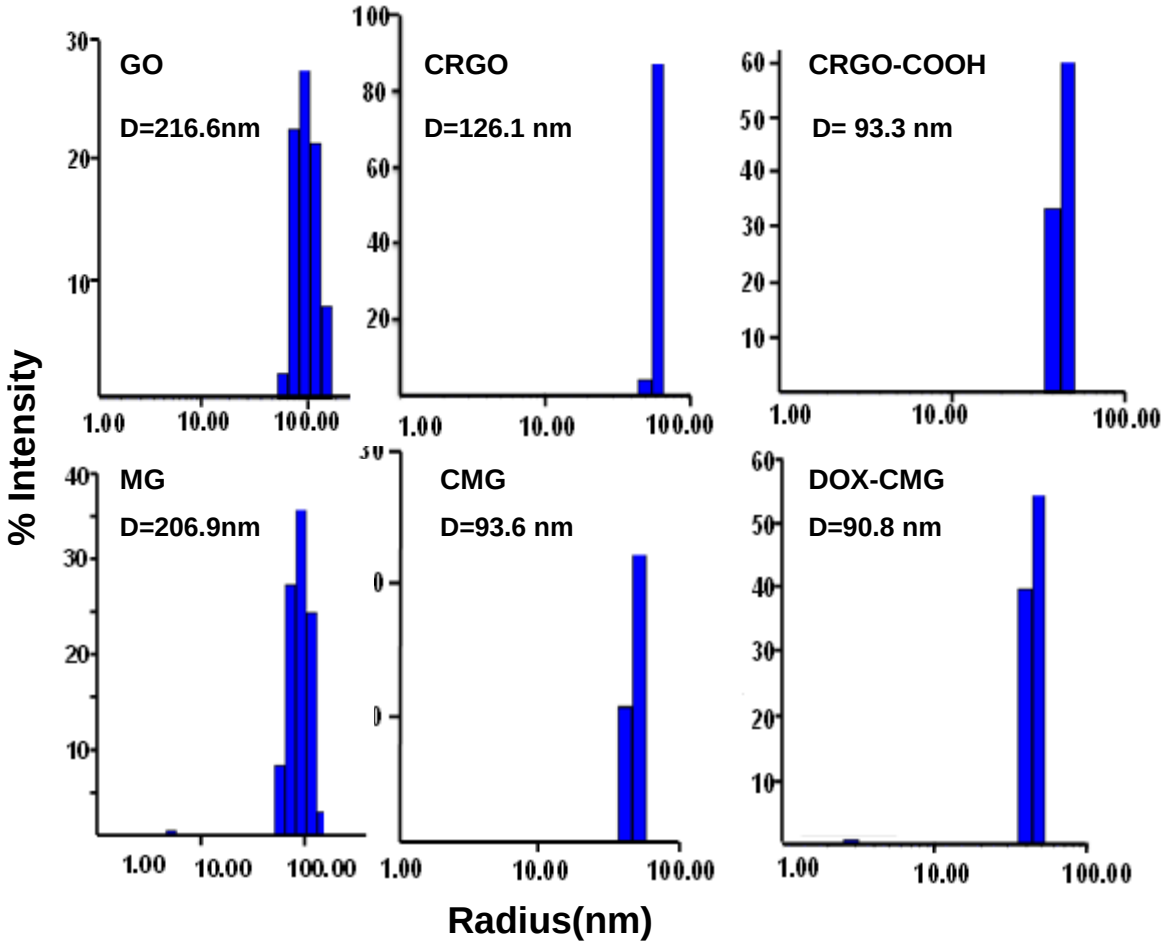

Figure S1: DLS shows the size distribution of GO, CRGO, CRGO-COOH, MG, CMG, DOX-CMG. (D, diameter)

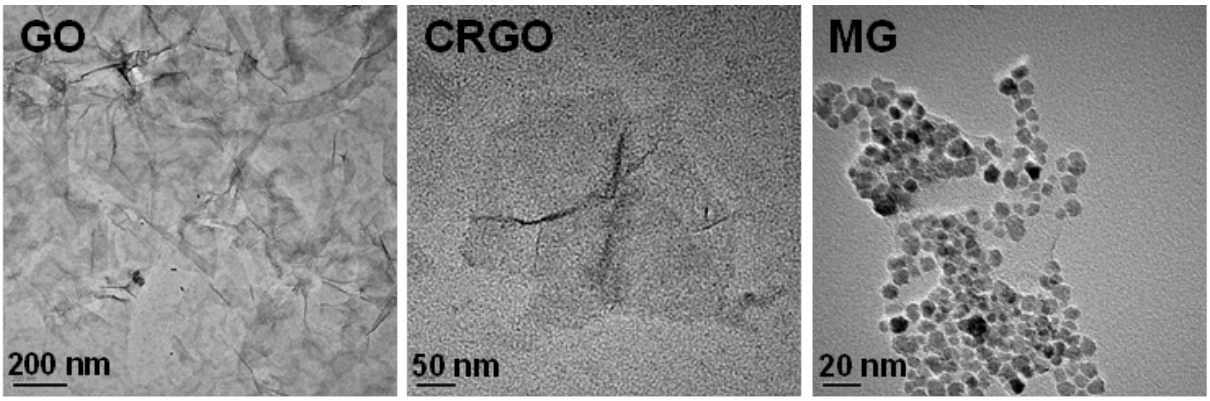

Figure S2, Transmission electron micrographs of GO, CRGO and MG

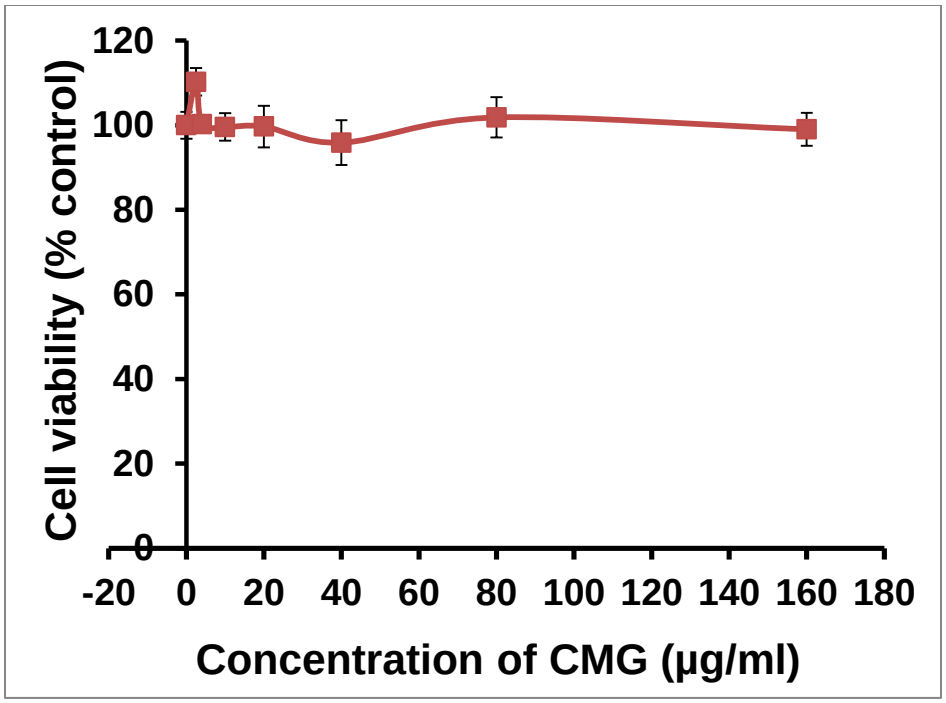

Figure S3, Viability of benign prostatic hyperplasia (BPH) cells treated with different concentrations of CMG.

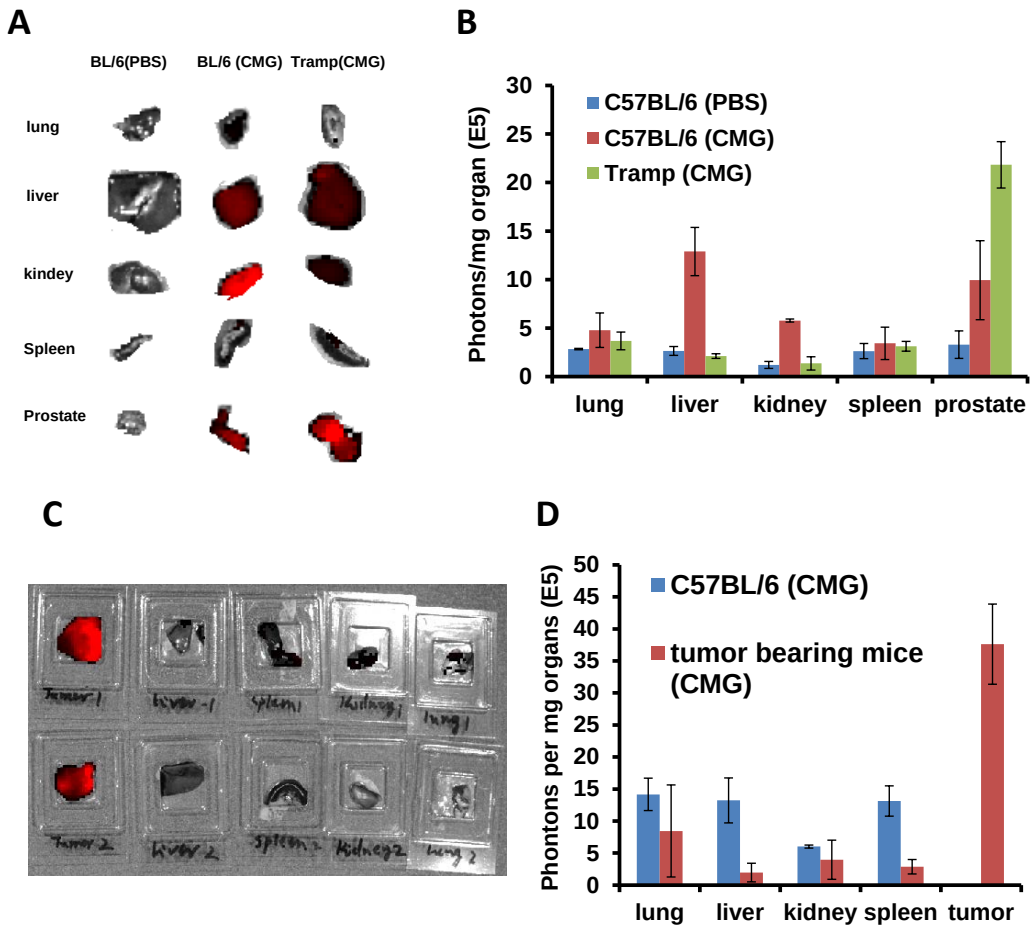

Figure S4: Biodistribution analyses of Cy5.5-CMG nanoparticles. Mice (n=2 per group) were injected i.p. with Cy5.5-CMG nanoparticles (500 µl sample with 500 µg CMG and 6.25 µg Cy5.5) nanoparticles. Four hours after injection, mice were sacrificed, organs collected and fluorescence of organs was imaged 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.

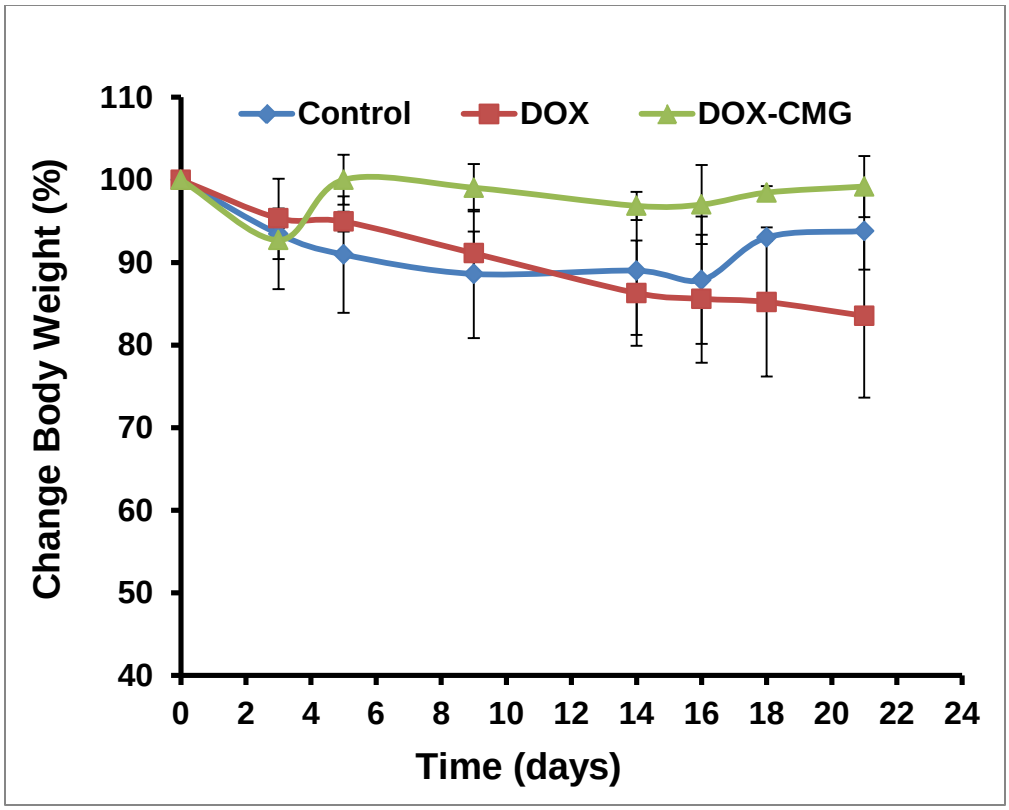

Figure S5: Percentage change in body weight with time post treatment. Body weight % = M_t/M_0 x100 where M_0 is the animal weight before injection and M_t is the animal weight at time t after injection. Each time-point represents mean ± SD.

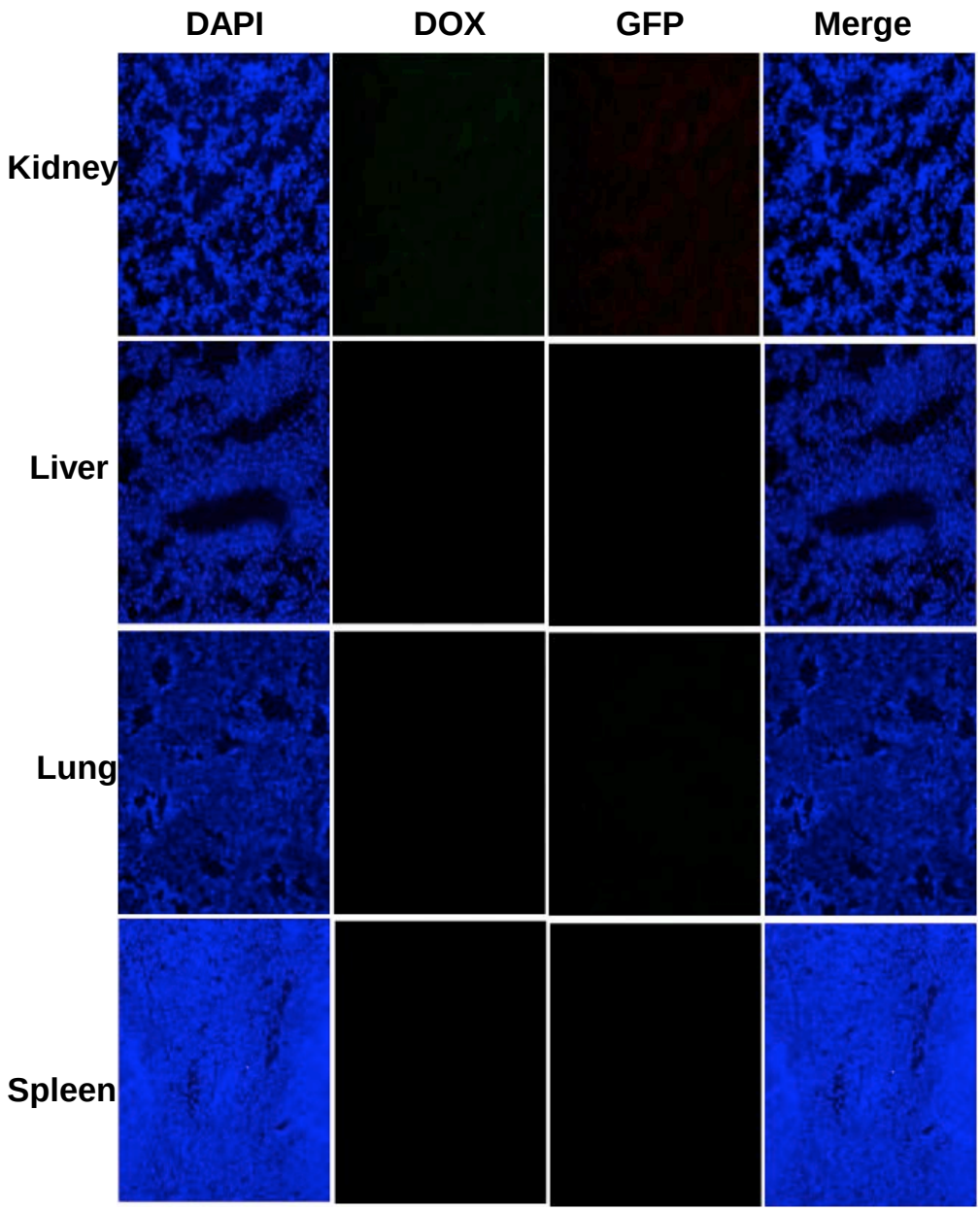

Figure S6: The represented images of DOX and GFP expression in LLC1 tumor-bearing mice. Mice (n=2 per group) were injected i.v. with DOX-CMG-GFP-DNA (30µg DOX and 25µg GFP-pDNA/mouse) nanoparticles. Twenty-four and forty-eight hours after injection, mice were sacrificed and frozen organ sections (Kidney,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

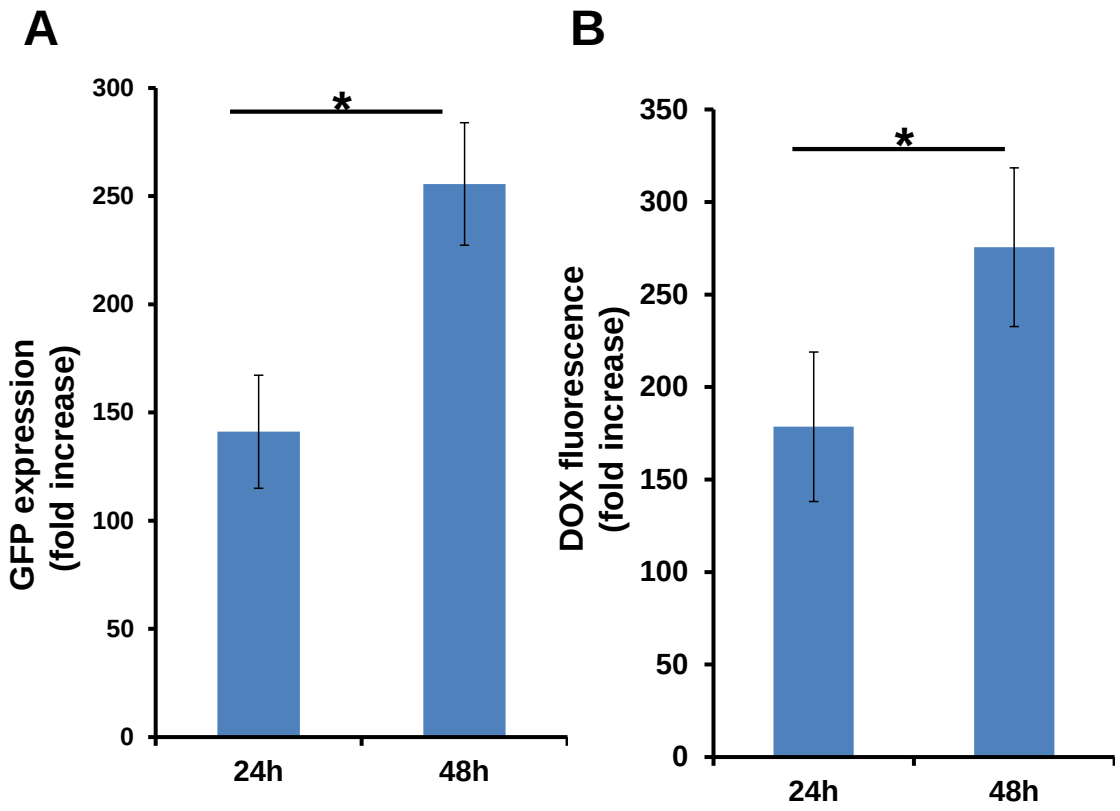

Figure S7: LLC1 tumor cells were implanted on both flanks (left and right flanks) of mice (n=2). Each mouse received a single i.p. injection of DOX-CMG-GFP-DNA. (30µg DOX, 25µg DNA/mouse, 500µl). 24 and 48 hrs after injection mice were sacrificed and frozen tumor sections were immunostained with anti-GFP 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, $p<0.05$.