

## Supplementary Information

### Microwave-assisted Fabrication of Carbon Nanotubes Decorated Polymeric Nano-medical Platforms for Simultaneous Drug Delivery and Magnetic Resonance Imaging

Hui Xie,<sup>1</sup> Selcuk Poyraz,<sup>2</sup> Mya Thu,<sup>1</sup> Yang Liu,<sup>2</sup> Evan Y. Snyder,<sup>1</sup> Jeffrey W. Smith<sup>1\*</sup> and Xinyu Zhang<sup>2\*</sup>

<sup>1\*</sup> Sanford-Burnham Medical Research Institute, 10901 North Torrey Pines Road La Jolla, CA 92037

<sup>2\*</sup> Department of Polymer and Fiber Engineering, Auburn University, Auburn, AL 36849

#### ***Preparation of Paclitaxel Loaded PLGA Particles***

The particles were prepared through a single emulsion process. Briefly, 100 mg Paclitaxel was dissolved in 12 mL PLGA (504H) solution in dichloromethane with 50 mg/mL concentration. The resulting solution was sonicated with 12 mL 1% polyvinyl alcohol solution within ice bath for 60 seconds to form emulsion. The emulsion was added into 100 mL 0.5% polyvinyl alcohol solution and stirred overnight to evaporate organic solvent. The particles were obtained by centrifuging the solution at 400 g and the resulting pellets were washed 3 times by Millipore water and lyophilized before use.

#### ***Drug Loading and Drug Release Experiments***

Paclitaxel content in the PLGA nanoparticles is assayed by a Thermo Scientific NanoDrop 1000 spectrophotometer (Wilmington, DE). Paclitaxel standards (0.04-2.0 mg/mL) were measured by UV-Vis at 251 nm using NanoDrop and a calibration curve was rendered. For Paclitaxel loading experiments, 1 mg particles were dissolved in 1 mL DMSO under vigorous vortexing. With the calibration curve, the UV-Vis absorbency at 251 nm of the sample solution was used to determine the concentration of encapsulated Paclitaxel in the particles and the loading ratio was found to be 12.2%.

The rate of drug release from CNT-Fe-PLGA particles is measured as a function of time during incubation in 1×PBS containing 0.1% between 80. Samples of 6.4 mg of nanoparticles are suspended in 1 mL PBS in a microcentrifuge tube and sonicated briefly in an ultrasonic water bath. The samples are then incubated on an orbital shaker at 37°C. The particles are centrifuged at 13.1K rpm for 10 minutes and supernatant removed and replaced with fresh solution at defined time points. The supernatant is lyophilized and the drug is extract using DMSO. The concentration of paclitaxel in supernatant was determined by absorbency of the Paclitaxel in the nanoparticle at 251 nm.

#### ***Magnetic Resonance Imaging (MRI)***

CNT-Fe-PLGA particles were suspended in 0.4% agarose gel and MRI was performed on an 11.7 T PharmaScan (Bruker, Billerica, MA) using a 35-mm Bruker birdcage coil. The T2 value for the sample was measured to be at 40-46 ms.