Supporting Information

Folic Acid Conjugated pH and Redox-Sensitive Ellipsoidal Hybrid Magnetic Nanoparticles for Dual-Triggered Drug Release

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Experimental

Materials

Fe(ClO₄)₃·6H₂O, tetraethyl orthosilicate (TEOS), (3-glycidyloxypropyl)trimethoxysilane (GPTS), ethanol, N-(3-dimethylaminopropyl)-N'-ethylcarbodiimide hydrochloride (EDAC) N-hydroxysuccinimide N,N'ammonia solution (25-28%),NaCl, (NHS), dicyclohexylcarbodiimide (DCC), urea, octadecyltrimethoxysilane (C18TMS), NaH₂PO₄, poly (L-histidine) (PLH, Mw= 5000-25000 g/mol) was purchased from Sigma. Polyethylene glycol diamine (H2N-PEG-NH2, Mw= 6000 g/mol and Mw= 3000 g/mol) was purchased from Aldrich. Dulbecco's modified eagle medium: nutrient mixture F-12 (DMEM/F12), fetal bovine serum (FBS), penicillin-streptomycin, trypsin-ethylene diamine tetra acetic acid (EDTA), phosphate buffered saline (PBS) and 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) were all from Thermo Fisher Scientific. All regents were used without further purification. T flasks, 96-well plates, and other cell culture plastics were purchased from Isolab GmbH. Muse Annexin V & Dead Cell Reagent was purchased from Merck-Millipore. Hoechst 33342 was from Cell Signaling Technology. FluoroDish cell culture dishes were obtained from WPI.



Figure S1. Calibration curves of DOX in PBS (0.01 M, pH = 7.4)

Results and Discussion



Figure S2. Cytotoxicity test of Hybrid-NPs (MHNPs) and FA-Hybrid-NPs (FA-MHNPs) at different concentrations in (A) MCF-7 (B) MDA-MB-231, (C) MCF-10A cells following 24 h, 48 and 72 h incubation by MTT assay (each point represents the mean \pm SD, n = 3)



Figure S3. Apoptotic effects of HMNPs-DOX, FA-HMNPs-DOX and DOX displayed with dot plots. Plots show show Annexin V vs cell size (population profile).