Supplementary Data

# Development of pH-responsive hyaluronic acid-conjugated cyclodextrin nanoparticles for chemo-/CO-gas dual therapy

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## Supplementary Information

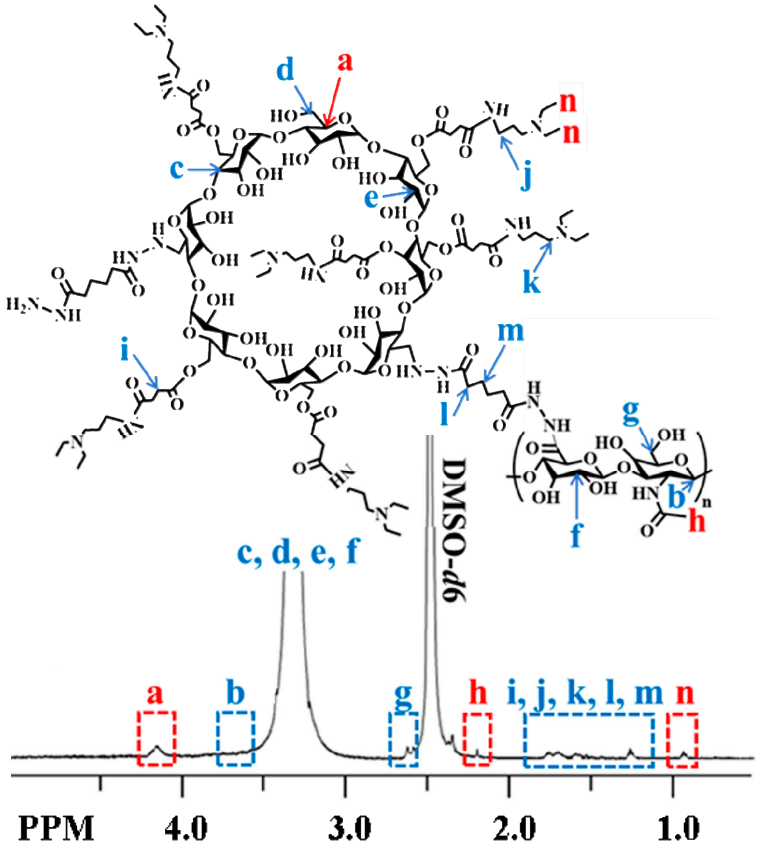


**Figure. S1.** $^{1}$H-NMR peaks of γCD-(DEAP$_{3.4}$/HA$_{2.1}$).

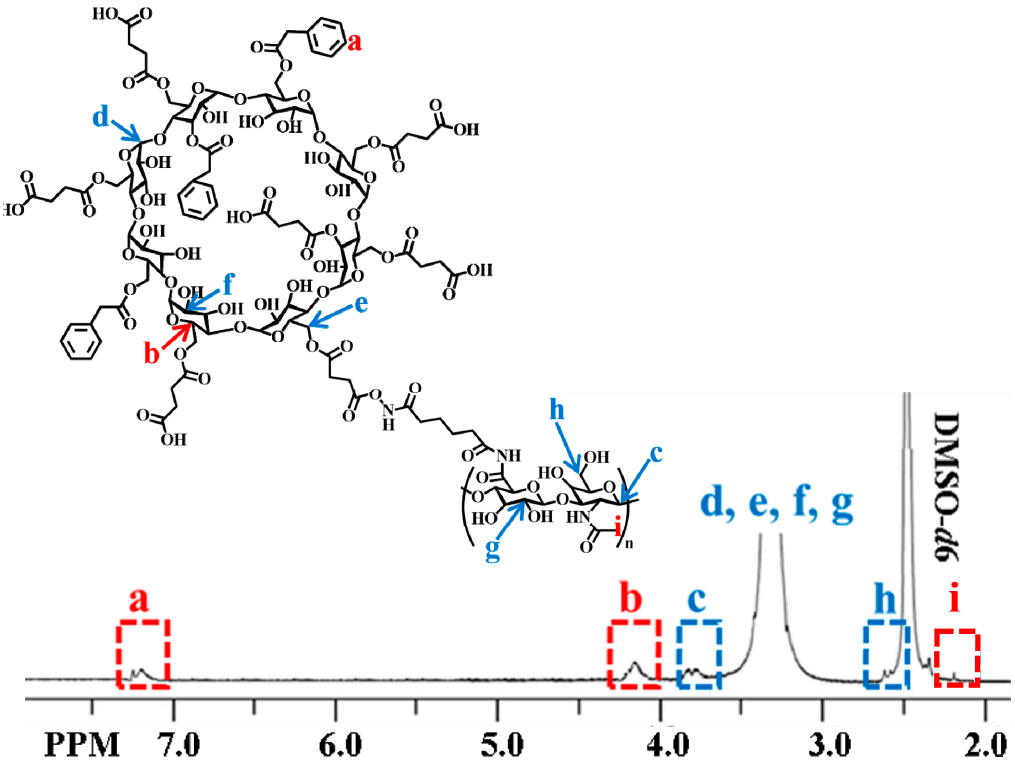


**Figure. S2.** $^{1}$H-NMR peaks of γCD-(PA$_{4.2}$/HA$_{2.0}$).

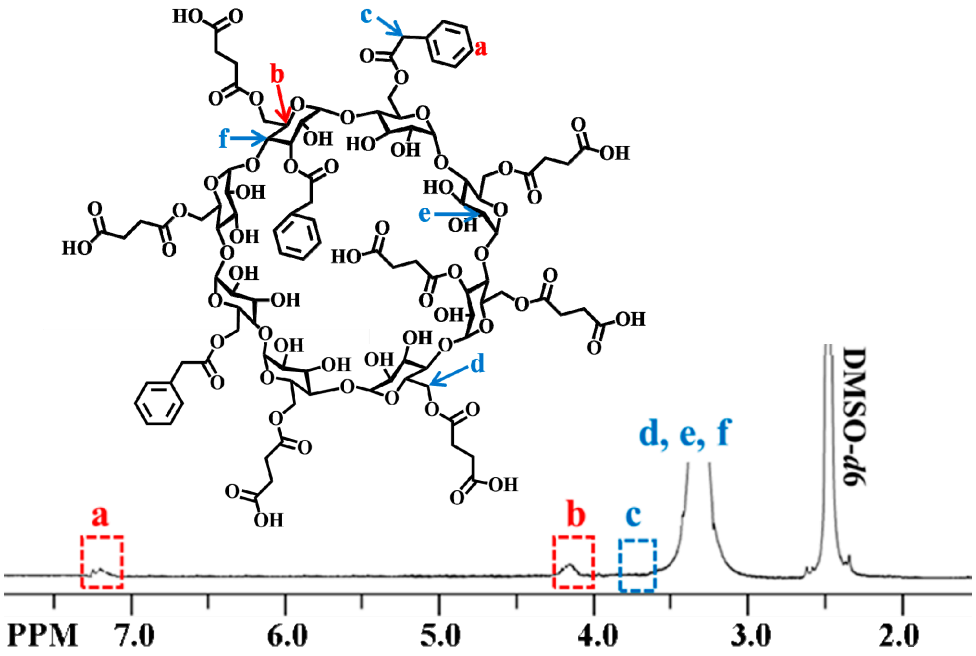


**Figure. S3.** $^{1}$H-NMR peaks of γCD-(PA$_{4.2}$).

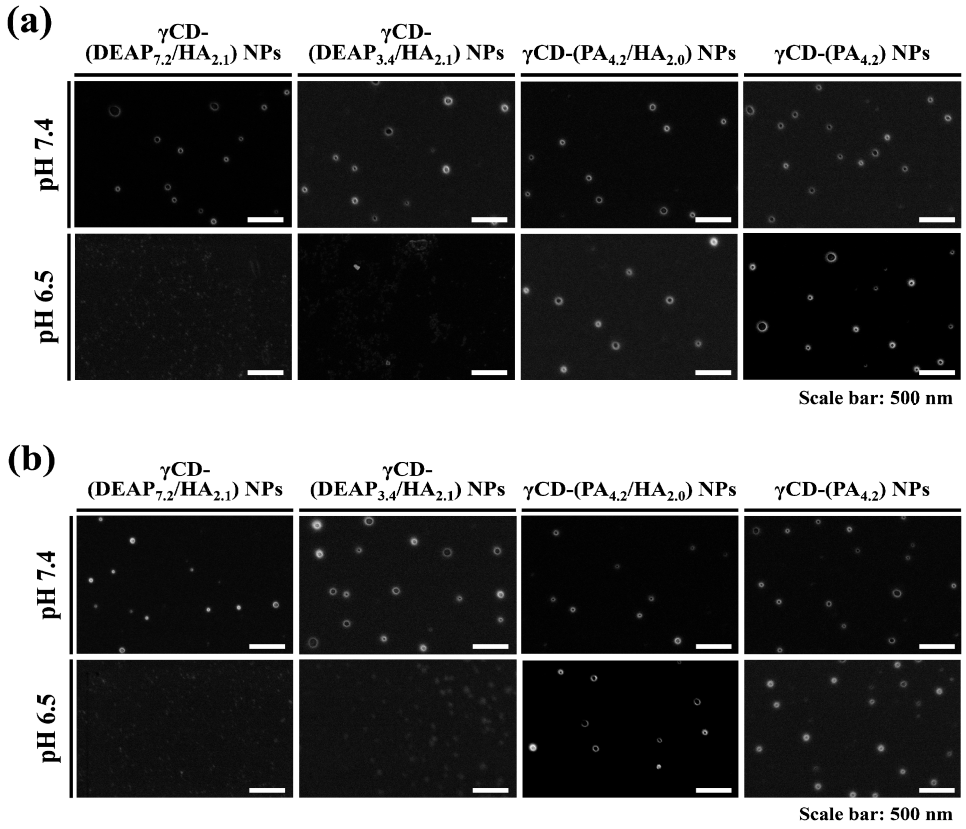


**Figure. S4.** FE-SEM images of γCD-(DEAP$_{7.2}$/HA$_{2.1}$) NPs, γCD-(DEAP$_{3.4}$/HA$_{2.1}$) NPs, γCD-(PA$_{4.2}$/HA$_{2.0}$) NPs, and γCD-(PA$_{4.2}$) NPs at pH 7.4 and 6.5 (**a**) without laser irradiation and (**b**) under laser irradiation at a light intensity of 1 W/cm$^2$ for 10 min.

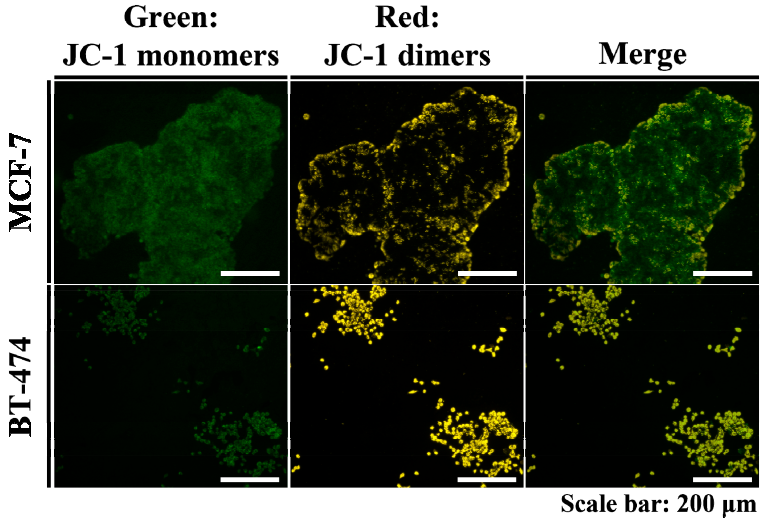


**Figure. S5.** Mitochondrial membrane hyperpolarization of MCF-7 or BT-474 cells treated with (PTX/FeCO)@γCD-(DEAP$_{7.2}$/HA$_{2.1}$) NPs. In brief, the MCF-7 or BT-474 tumor cells were incubated with (PTX/FeCO)@γCD-(DEAP$_{7.2}$/HA$_{2.1}$) NPs, with an equivalent FeCO concentration of 6.75 μg/mL, at 37 °C for 4 h. Subsequently, the cells were washed with fresh PBS (pH 7.4) and exposed to 808 nm irradiation at a power density of 0.5 W/cm$^2$ for 10 min. Afterward, the resulting cells ($1\times10^6$ cells) were treated with 1,1',3,3'-tetraethyl-5,5',6,6'-tetrachloroimidacarbocyanine iodide (JC-1) at a concentration of 0.25 μg/mL for 20 min. The cells were then examined using a fluorescence microscope to analyze the mitochondrial membrane hyperpolarization. The JC-1 dye used in this experiment was purchased from Sigma-Aldrich (St. Louis, MO, USA).