Supporting Information

Janus Nanocarriers for Magnetically Targeted and Hyperthermia-Enhanced Curcumin therapy of liver cancer

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Keywords: Janus, Curcumin, liver cancer, magnetic target, magnetic hyperthermia therapy

Materials

Polyacrylic acid (PAA, 8 mmol, Mw 1800), iron (III) chloride anhydrous ($FeCl_3$), diethylene glycol (DEG), cetyltrimethyl ammonium bromide (CTAB), tetraethyl orthosilicate (TEOS, 98%), 3-Aminopropyltriethoxysilane (APS), fluorescein isothiocyanate (FITC), Sulforhodamine B (SRB) were purchased from Sigma-Aldrich. Cur was purchased from Sinopharm Chemical Reagent Co., Ltd. (Shanghai, China). Sodium hydroxide (NaOH), ammonium hydroxide (NH_4OH, 28%), ammonium nitrate (NH_4NO_3), anhydrous ethanol, sucrose, succinic anhydride and hydrochloric acid were obtained from Beijing Chemical Reagent Co. (Beijing China). Dulbecco's modified Eagle medium-high glucose (DMEM-HG), RPMI-1640 medium and fetal bovine serum (FBS) were obtained from GIBCO. All reagents were commercially available products of analytical-grade purity and were used without further purification.

Characterization

The histomorphology of the Janus M-MSNs was observed by means of transmission electron microscopy (TEM, JEM-2100, JEOL). The size and distribution of the Janus M-MSNs were determined through a Nano- ZS 90 Nanosizer (Malvern Instruments Ltd., Worcestershire, U.K.). The surface area was characterized via the Brunauer-Emmett-Teller (BET) method. The pore size distribution was calculated by the Barrett-Joyner-Halenda (BJH) method. Magnetization was measured by a TDM-B vibrating sample magnetometer (VSM) at 300 K. The temperature increased by magnetic hyperthermia was assessed by detecting the temperature of RPMI-1640 containing 10% FBS with diverse concentrations of Janus M-MSNs@Cur (0, 6.25, 12.5, 25, 50, 100 mg mL^{-1}) which was meditated by an alternative current magnetic field (ACMF).

Statistical analysis

Data were represented as the mean ±SD values. The statistical significance of the data was determined by Student's t-test.

Figure Caption

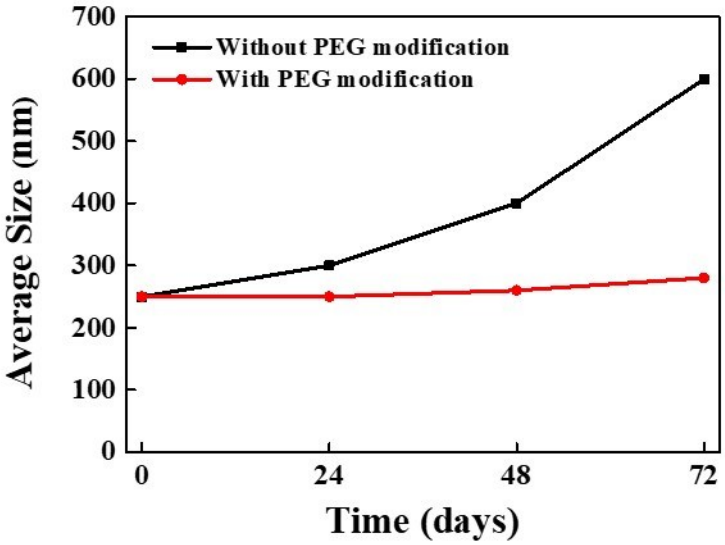

Figure 1S. Average size of Janus M-MSNs for 24, 48 and 72 hours.

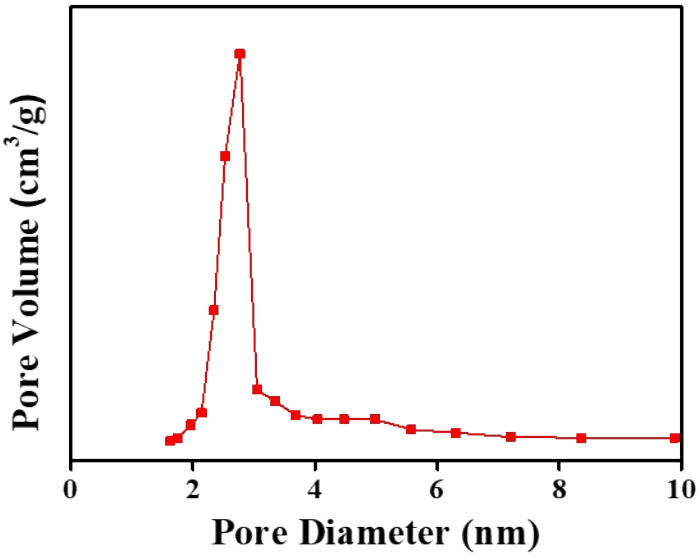

Figure 2S. Pore size distribution of Janus M-MSNs.

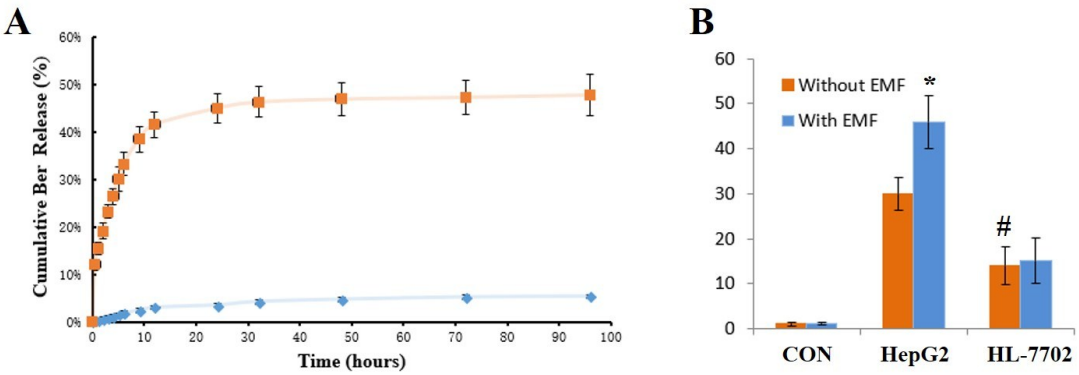

Figure 3S. pH-responsive Cur-release fashion of Janus M-MSNs-Cur. (A) pH- responsive Cur-release profiles of Janus M-MSNs-Cur. (B) Quantitative analysis of the biodistribution of Cur in free Cur or Janus M-MSNs-Cur treated HepG2 cells or HL-7702 cells in the absence or presence of EMF for 3 h. (2.5 h of incubation followed by 0.5 h exposure of magnetic field in EMF treated group). Data represent three separate experiments and are presented as the mean ± SD $^{*}P < 0.05$ vs without EMF group in HepG2 cells; $^{\#}P < 0.05$ vs with or without EMF group in HepG2 cells