Electronic Supplementary Information (ESI)

Multifunctional triple-porous Fe$_3$O$_4$@SiO$_2$ superparamagnetic microspheres for potential hyperthermia and controlled drug release

Xuegang Lu*, Qianru Liu, Liqun Wang, Wenying Zhang, Wenfeng Jiang, Xiaoping Song

MOE Key Laboratory for Non-equilibrium Synthesis and Modulation of Condensed Matter.
School of Science, Xi’an Jiaotong University, Xi’an 710049, China.

*Corresponding author.: Xuegang Lu, Tel.: +86 29 82663034; fax: +86 29 83237910. E-mail address: xglu@mail.xjtu.edu.cn

Fig. S1 SEM image for $m$-Fe$_3$O$_4$@CTAB/SiO$_2$ microspheres.
Fig. S2 Zeta potential distribution of the initial prepared \( m \)-Fe\(_3\)O\(_4\)@\( dm \)-SiO\(_2\) microspheres in aqueous solution.

Fig. S3 Zeta potential distribution of the \( m \)-Fe\(_3\)O\(_4\)@\( m \)-SiO\(_2\) microspheres in aqueous solution after being stored for 30 days.

Fig. S4 Zeta potential distribution of the \( m \)-Fe\(_3\)O\(_4\)@\( dm \)-SiO\(_2\) microspheres in PBS buffer solution at pH 7.4.
Fig. S5 Mean hydrodynamic diameter ($D_h$) changes of \( m\text{-Fe}_3\text{O}_4@\text{dm-SiO}_2 \) microspheres before and after incubation with human blood plasma.

Fig. S6 Drug loading profile in mesoporous \( m\text{-Fe}_3\text{O}_4@\text{dm-SiO}_2 \) microspheres.
Fig. S7 TEM image of porous Fe₃O₄ microspheres

Fig. S8 N₂ adsorption-desorption isotherms and pore size distribution (the inset) of the synthesized porous
Fe$_3$O$_4$ microspheres. The BET surface area is 26.5 m$^2$/g.

**Fig. S9** TEM image of $m$-Fe$_3$O$_4$@$d_m$-SiO$_2$ microspheres after 3 h of hot water etching

**Fig. S10** TEM image of $m$-Fe$_3$O$_4$@$m$-SiO$_2$ microspheres prepared with CTAB templating and without PVP protecting. Only perpendicular aligned mesochannels can be observed in SiO$_2$ shells.
Fig. S11 TEM image of $m$-$\text{Fe}_3\text{O}_4@m$-$\text{SiO}_2$ microspheres prepared with PVP protecting and without CTAB templating. Only randomly distributed pores can be observed in SiO₂ shells.

Fig. S12 N₂ adsorption-desorption isotherms of the $m$-$\text{Fe}_3\text{O}_4@m$-$\text{SiO}_2$ microspheres prepared with CTAB templating and without PVP protecting. The BET surface area is 304.5 m²/g
Fig. S13 N\textsubscript{2} adsorption-desorption isotherms of the m-Fe\textsubscript{3}O\textsubscript{4}@m-SiO\textsubscript{2} microspheres prepared with PVP protecting and without CTAB templating. The BET surface area is 86.9 m\textsuperscript{2}/g.

Fig. S14 Images of SGC-7901 cells after being cultured at different concentrations of m-Fe\textsubscript{3}O\textsubscript{4}@dm-SiO\textsubscript{2}/5-FU for 24 h: (a) 0 µg/mL, (b) 32 µg/mL, (c) 200µg/mL.