Electronic Supplementary Information (ESI) for Dalton Transactions

# Ultra-small Mesoporous Silica Nanoparticle as an Efficient Carrier for pH Responsive Releases of Anti-cancer Drugs

Haoquan Zheng*, Cheuk-Wai Tai, Jie Su, Xiaodong Zou, Feifei Gao*

*Berzelii Center EXSELENT on Porous Materials and Department of Materials and Environmental Chemistry, Stockholm University, Stockholm, SE-106 91, Sweden; E-mail: feifei.gao@mmk.su.se, haoquan.zheng@mmk.su.se*

## SUPPORTING INFORMATION

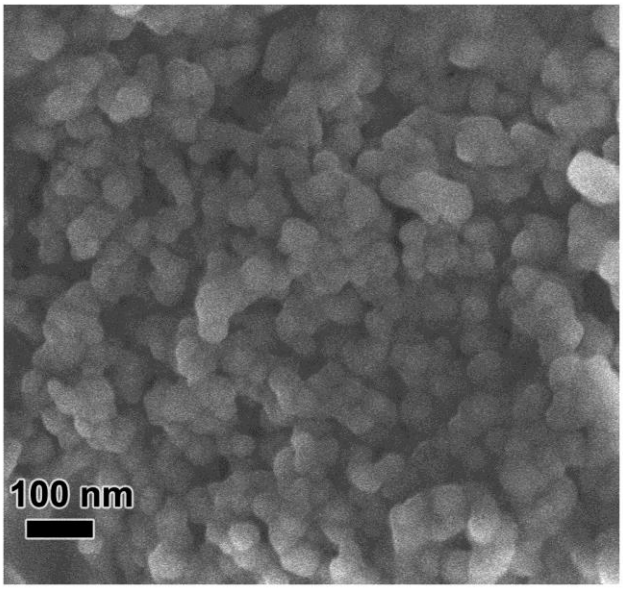


**Fig. S1.** SEM image of UMSN**.**

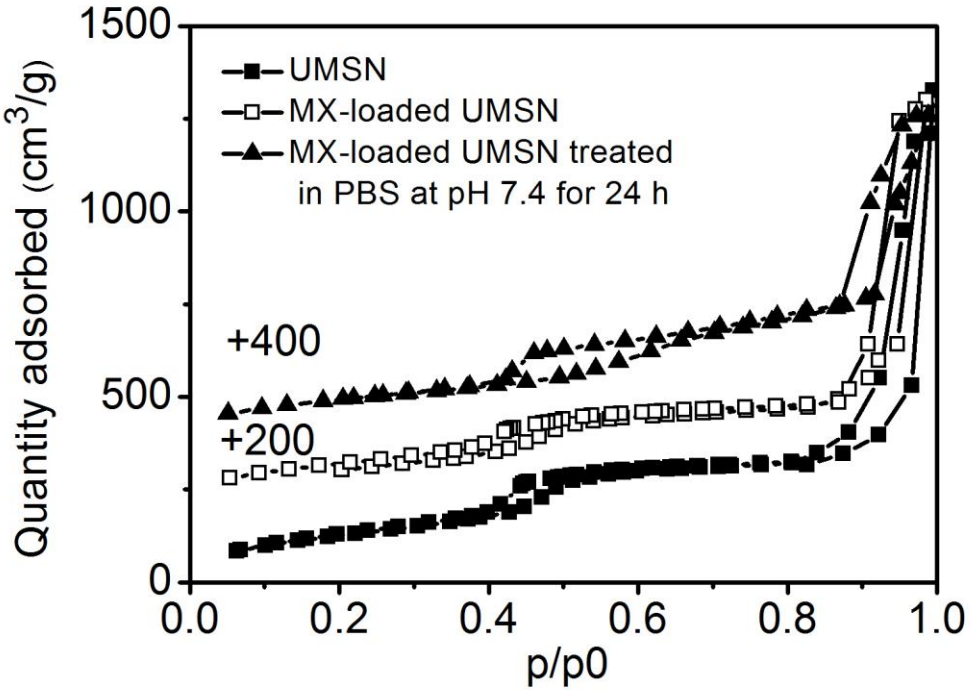


**Fig. S2.** $N_2$ adsorption/desorption isotherms.

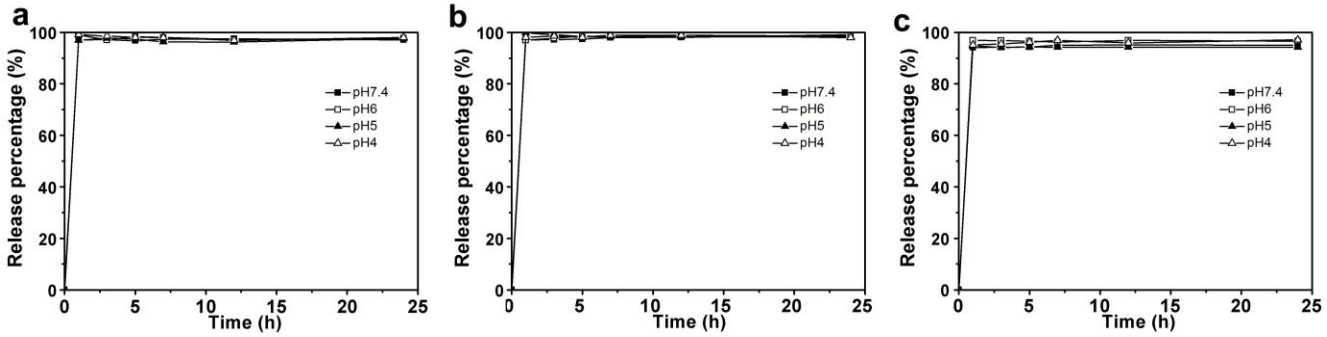


**Fig. S3.** The solubilization kinetic profiles of free MX (a), DOX (b) and MTX (c) at different pH values.

**Table S1** Porosity properties obtained from $N_2$ adsorption-desorption.

| | BET Surface area ($m^2/g$) [a] | Mesopore volume ($mm^3/g$) [b] | Pore size (nm) [c] |
|---|---|---|---|
| UMSN | 452 | 0.71 | 4.0 |
| MX-loaded UMSN | 333 | 0.50 | 3.9 |
| MX-loaded UMSN treated in PBS at pH 7.4 for 24 h | 414 | 0.67 | 4.3 |

[a]Calculated by BET method; [b] Calculated by the adsorbed amount at relative pressure of ~ 0.8 ; [C]Determined by the BJH pore size distribution (based on adsorption branch of isotherms).

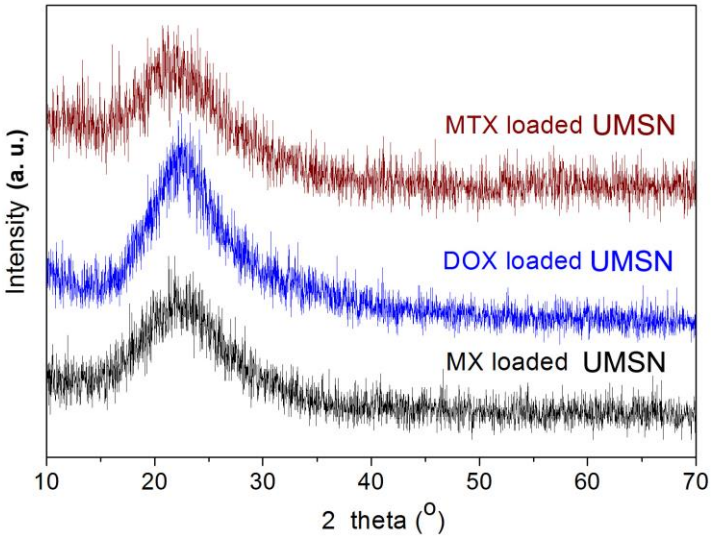


**Fig. S4.** Wide angle XRD patterns of drug-loaded UMSN.

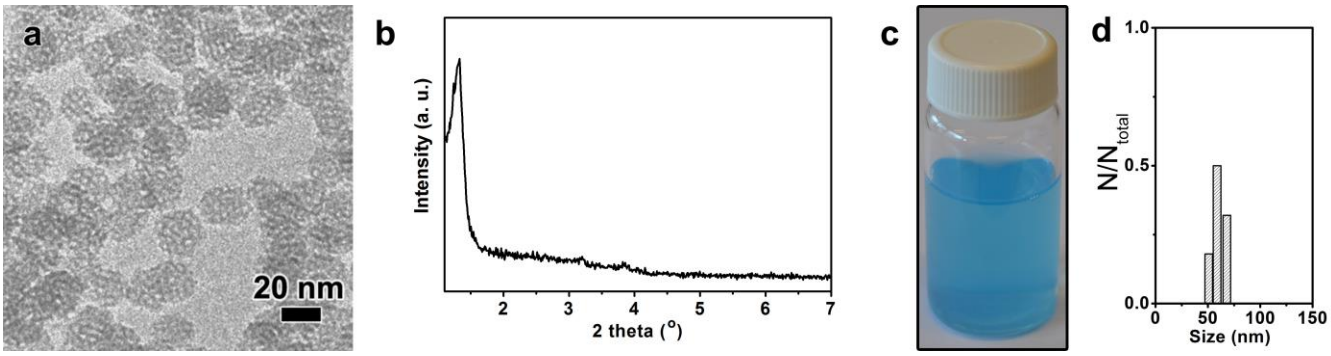


**Fig. S5.** TEM image (a), XRD pattern (b), photograph (c) and DLS (d) of MX-loaded UMSN.