Supplementary information

Targeted delivery and controlled release of doxorubicin to cancer cells by smart ATP-responsive Y-shaped DNA structure-capped mesoporous silica nanoparticles

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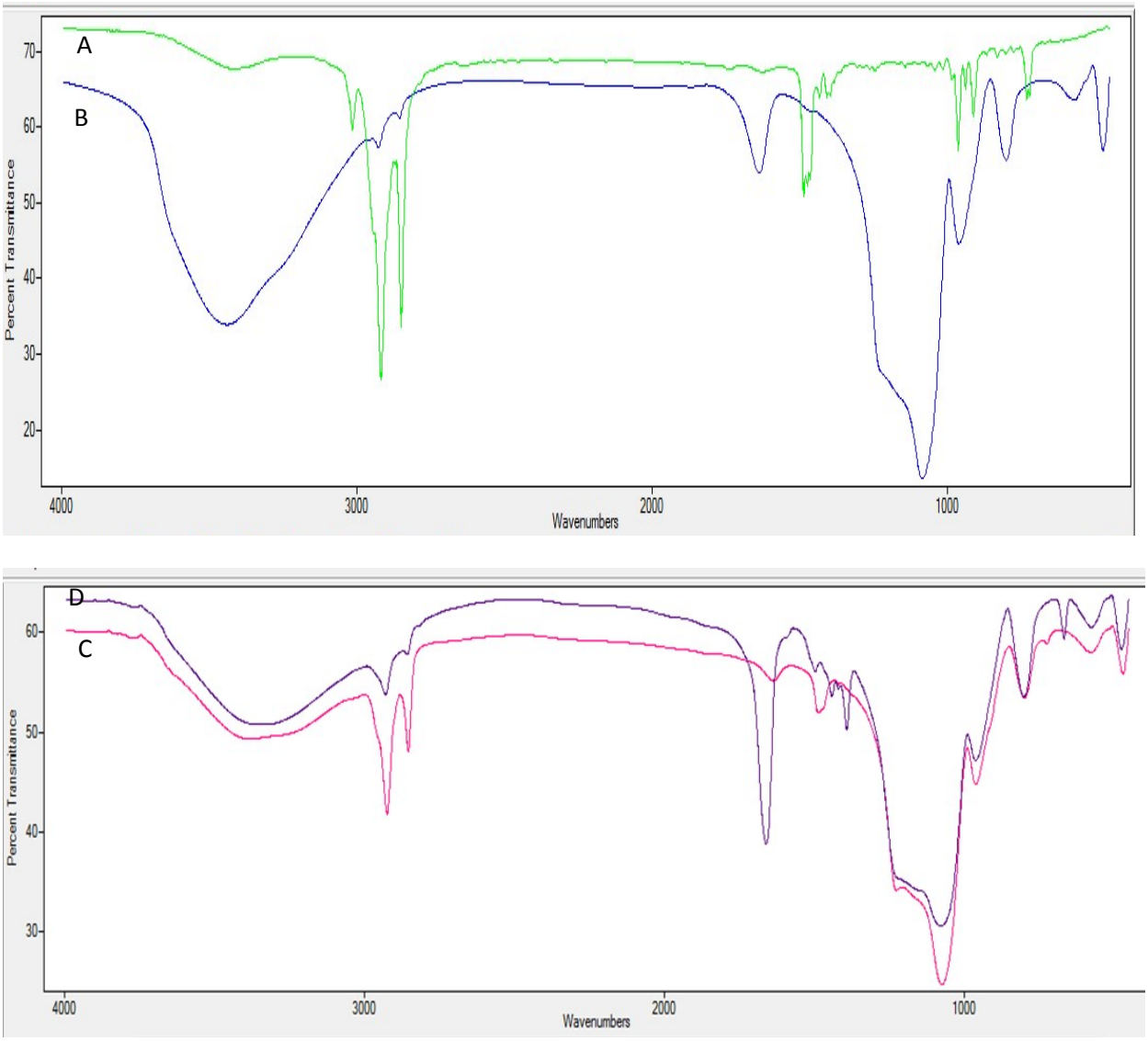

Figure S1. FTIR spectra of (A) CTAB (B) MSNs (C) MSNs-NH_2 and (D) MSNs-COOH.

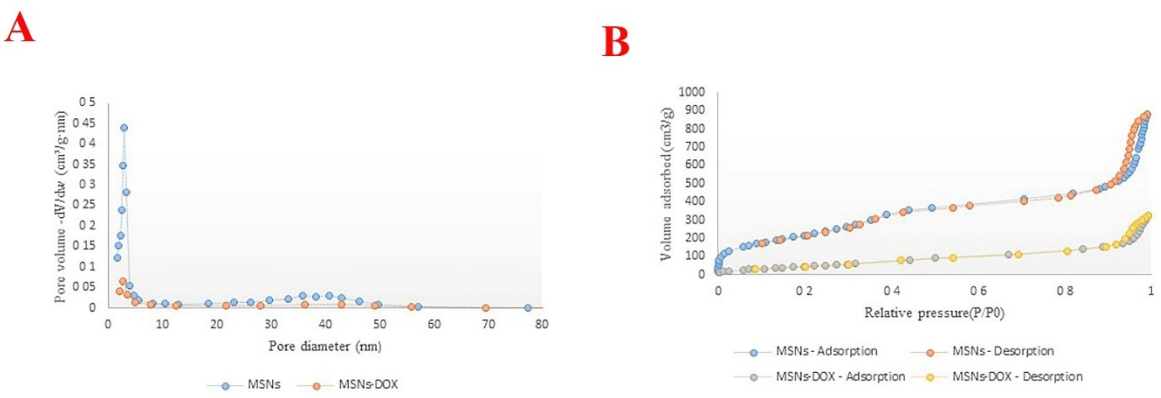

Figure S2. Nitrogen adsorption–desorption isotherms and pore size distribution of MSNs.

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Sample	BET surface area (m^2/g)	BET pore volume (cm^3/g)	BJH pore diameter (nm)
MSN	837 $m^2/g \pm 7$ m^2/g	1.09	2.9
DOX@ MSN	7145 m^2/g	0.88	

Table S1. Data representation for Nitrogen adsorption–desorption test and pore size distribution of the synthesized MSN and prepare DOX@MSN

Sample	Size (nm)	PDI	Zeta potential [mV]
MSNs	115.3±5	0.204±.023	-7.8±0.7
MSNs-NH_2	121±4.5	0.27±.036	+16.5±0.7
MSNs-COOH	145±6	0.456±.012	-58.1±0.4

Table S2. Dynamic light scattering measurements of the MSNs, MSNs-NH_2 and MSNs-COOH.

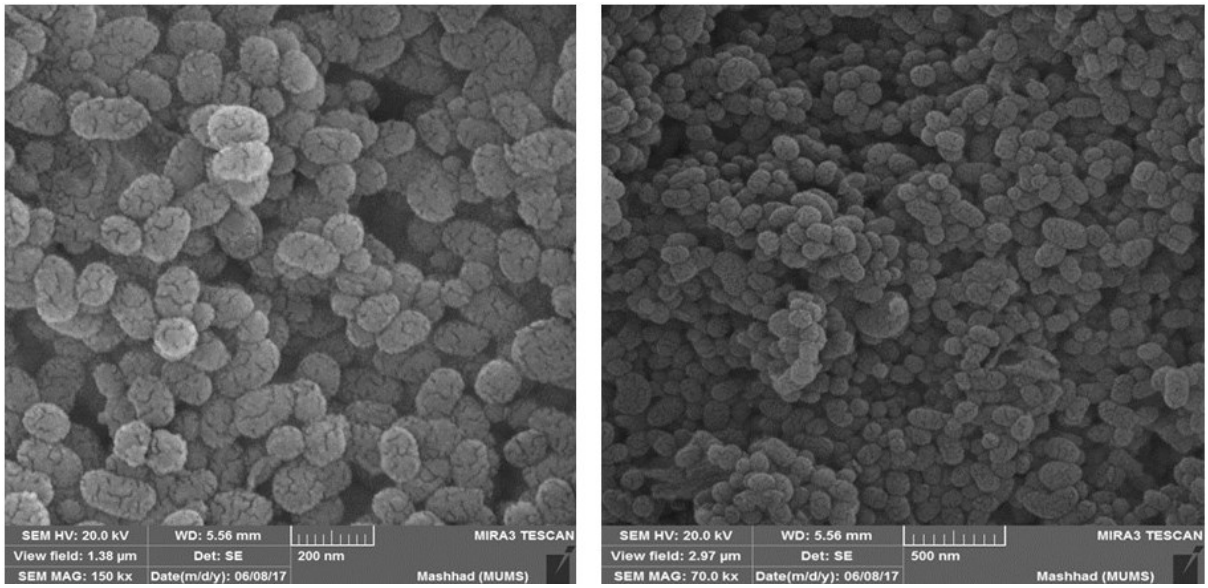

Figure S3. SEM images of MSNs at different resolutions.

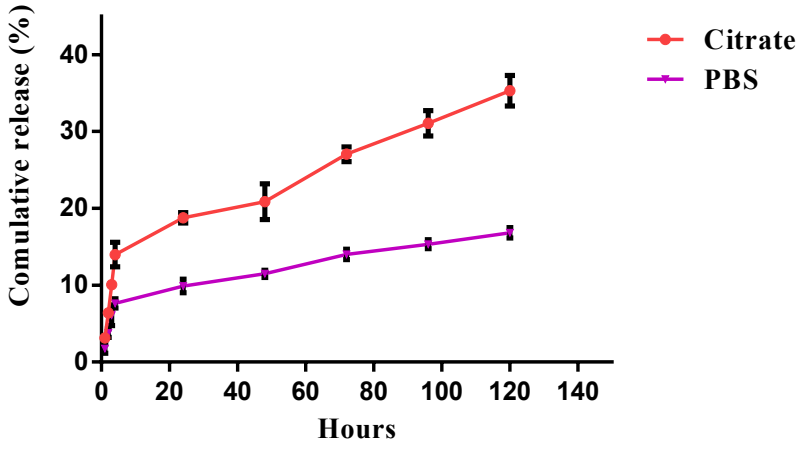

Figure S4. Release profile of DOX from DOX@MSNs in citrate buffer (pH 5.4) and PBS (pH 7.4).

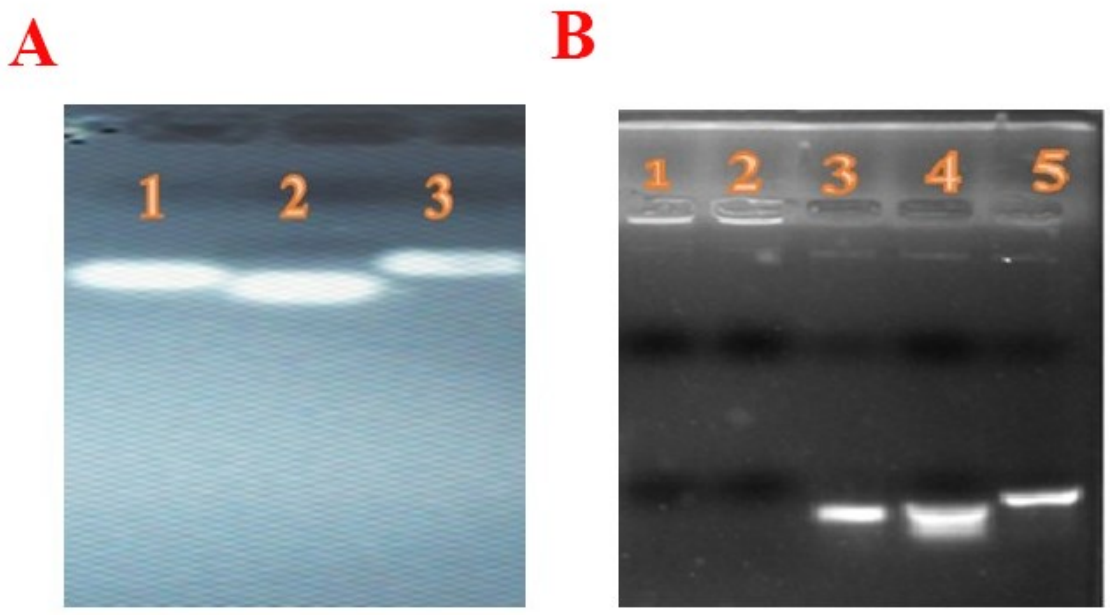

Figure S5. Gel retardation assay. (A) Formation of ATP1/ATP2 aptamers conjugation. Lane 1:ATP1 aptamer, lane 2: ATP2 aptamer and lane 3: ATP1 and ATP2 aptamer conjugate; (B) Attachment of aptamers to the surface of MSN. Lane 1: Attachment of ATP aptamers to DOX@MSNs-MUC1 (formation of DOX@MSNs-Apts), lane 2: attachment of MUC1 aptamer to MSNs (formation of DOX@MSNs-MUC1), lane 3: ATP1 aptamer, lane 4: ATP2 aptamer and lane 5: MUC1 aptamer