Carriers for Hydrophobic Drug Molecules: Lipid-Coated Hollow Mesoporous Silica Particles, and the Influence of Shape and Size on Encapsulation Efficiency

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Supplementary information:

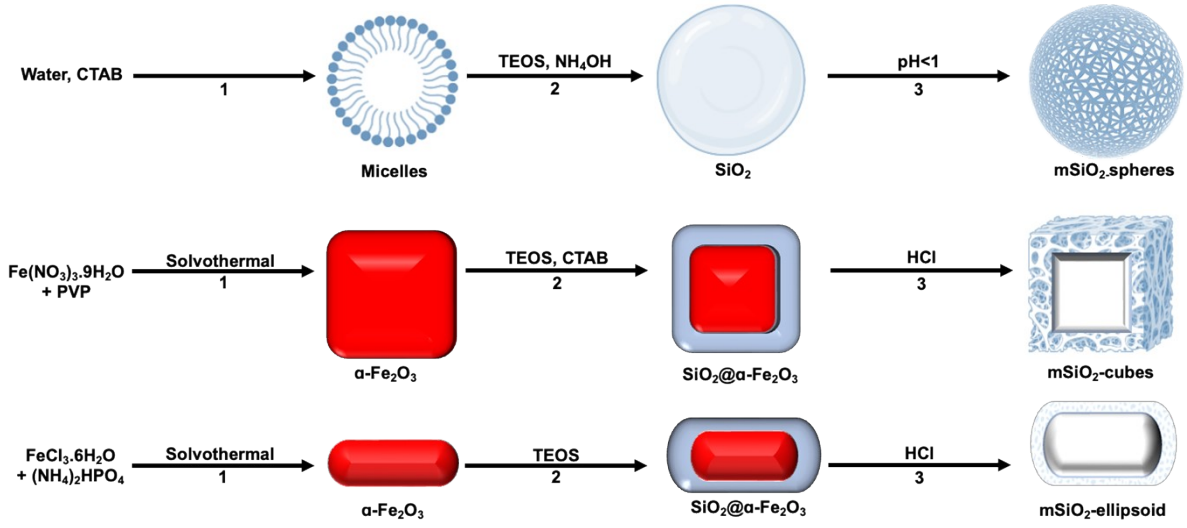


Figure S1. Schematic representation of mesoporous silica nanocarriers (spheres, cubes and capsules) designed using iron oxide NPs as hard templates and CTAB as a soft template. The modified Stöber synthesis method was

employed to coat silica onto these templates. Subsequently, the iron oxide core was selectively HCl etched to achieve the formation of hollow silica nanocarriers.

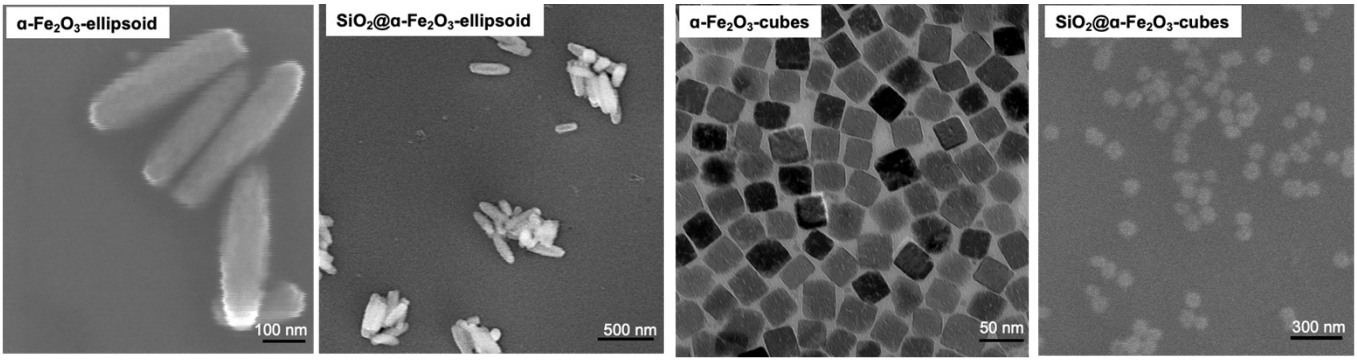
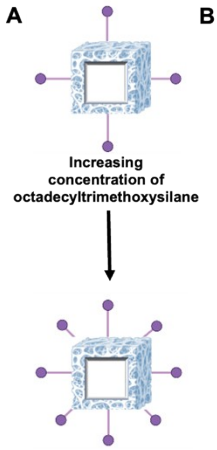


Figure S2. Morphological evaluation of iron core and core-shell nanoparticles by SEM. (A) α-Fe_2O_3-ellipsoid. (B) core-shell SiO_2@α-Fe_2O_3 ellipsoid. (C) α-Fe_2O_3-cubes. (D) core-shell SiO_2@α-Fe_2O_3 cubes.



B

$mSiO_2$ [mg]	OTMS [mmolar]	OTMS (µl)	Tamoxifen concentration [mmolar]	Encapsulation efficiency [%]
20.0	1.40	5	0.151	50.7
20.0	6	25	0.151	55.3
20.0	12	50	0.151	66.9
20.0	23.57	100	0.151	78.3
20.0	47	200	0.151	85.7
20.0	94	400	0.151	65.4
20.0	118	500	0.151	44.1

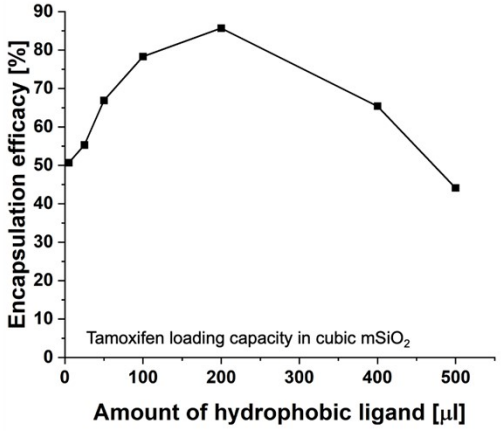
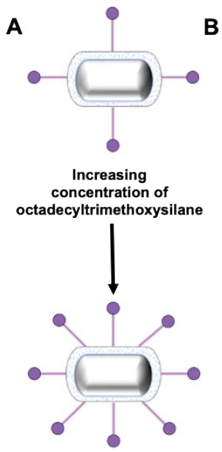


Figure S3. Determination of drug loading capacity with an increasing concentration of conjugated OTMS in mesoporous silica cubes.



B

$mSiO_2$ [mg]	OTMS [mmolar]	OTMS (µl)	Tamoxifen concentration [mmolar]	Encapsulation efficiency [%]
20.0	1.40	5	0.151	10.3
20.0	6	25	0.151	15.7
20.0	12	50	0.151	20.4
20.0	23.57	100	0.151	25.3
20.0	47	200	0.151	7.7
20.0	94	400	0.151	3.4
20.0	118	500	0.151	1.1

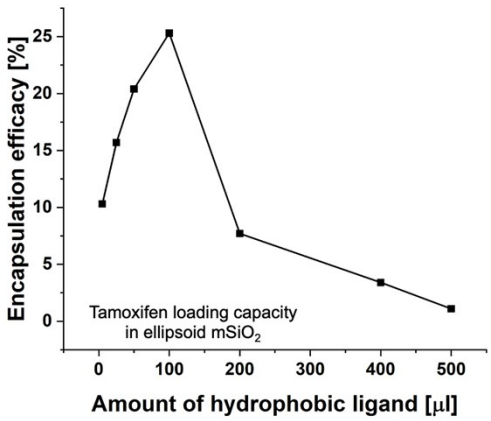


Figure S4. Determination of drug loading capacity with an increasing concentration of conjugated OTMS in mesoporous silica ellipsoid.

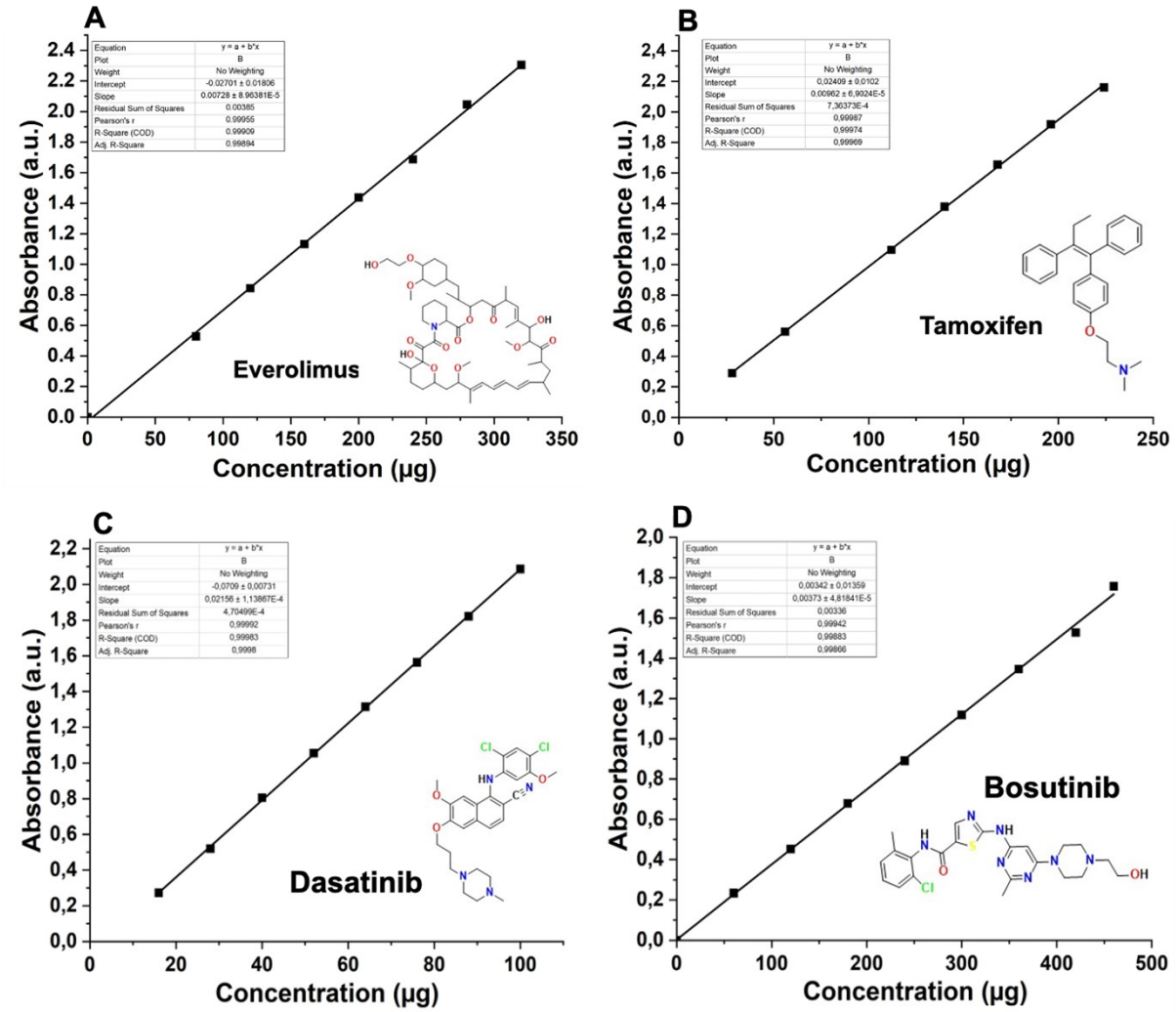


Figure S 5. Calibration curves: A) Everolimus B) Tamoxifen C) Dasatinib D) Bosutinib

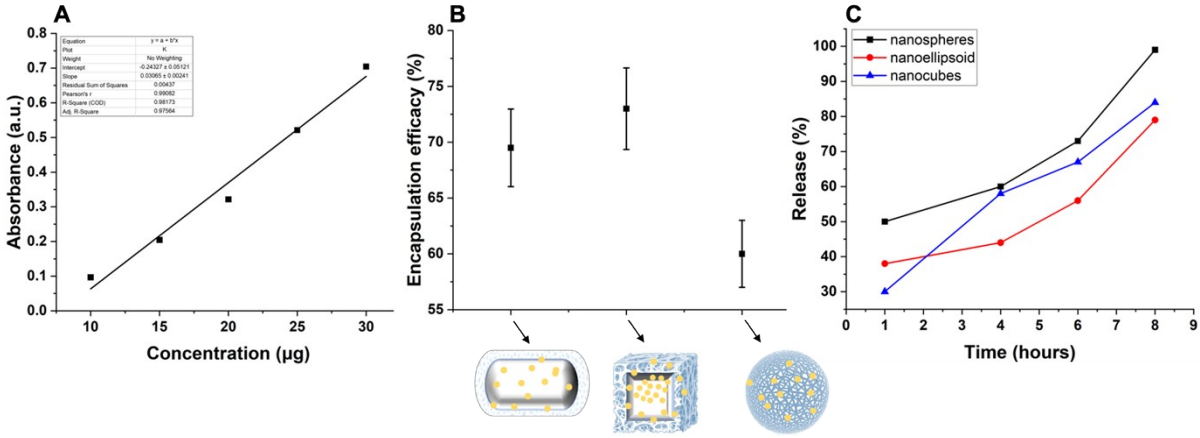


Figure S6. FITC encapsulation and release: A) Calibration curve for FITC. B) Encapsulation efficacy of all nanocarriers. C) FITC release from nanocarriers within 8 hours.