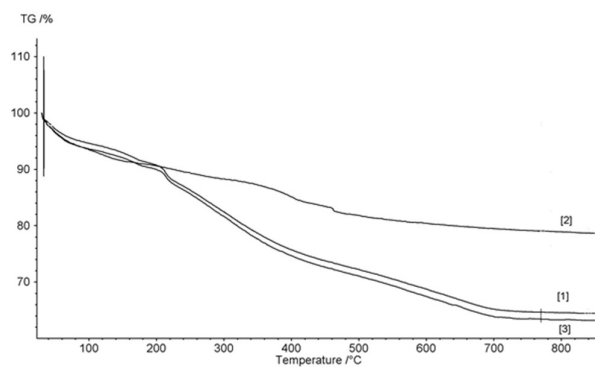


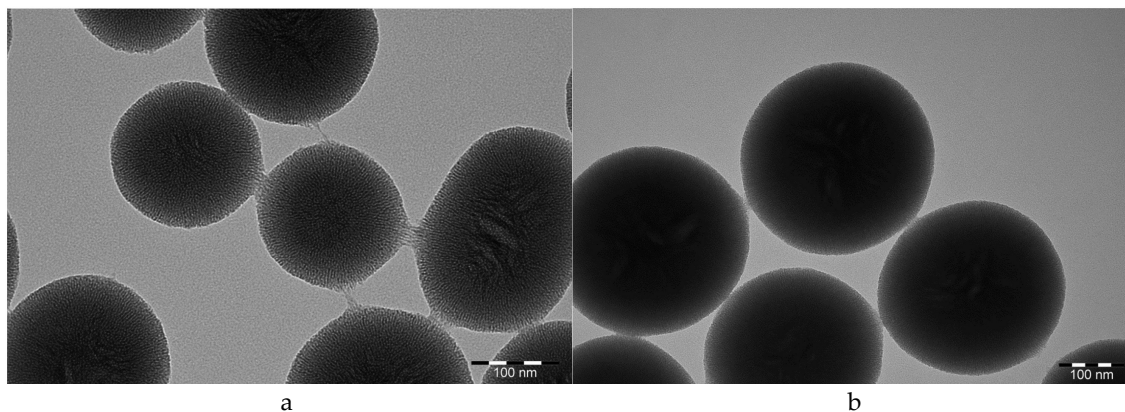
Supplementary Table S1. Ink properties.

	Dynamic viscosity (mPas) @ 1000 s <sup>-1</sup> , 22 ± 0.5 °C	Surface tension (mN/m) @ 23 ± 0.5 °C, 1 px = 1.0576 × 10 <sup>-5</sup>	Density (g/cm <sup>3</sup> ) @ 23 ± 0.5 °C
Ink (blank)	6.27	43.73 ± 0.34 44.82 ± 0.16 *	1.043
MSN 1 mg/ml	6.15	44.55 ± 0.52	1.044
MSN 5 mg/ml	6.21	43.59 ± 0.52	1.044
MSN-PEI 1 mg/ml	x	45.24 ± 1.16 *	x
MSN-PEI 5 mg/ml	x	45.34 ± 0.41 *	x
MSN-PEI-F5 1 mg/ml	x	44.91 ± 0.51	1.043
MSN-PEI -F15 1 mg/ml	x	44.55 ± 0.69	1.044
MSN-PEI-F5 5 mg/ml	x	44.42 ± 0.56	1.044
MSN-PEI -F15 5 mg/ml	x	43.05 ± 0.16	1.043

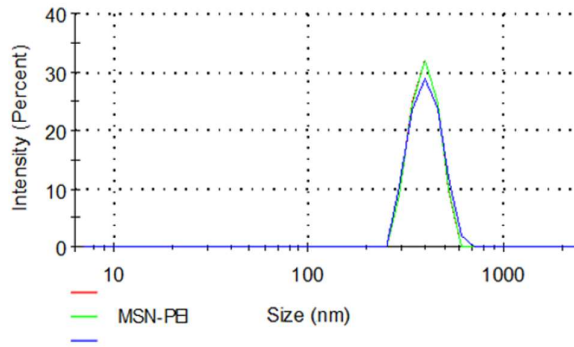
\* 1 px = 1.0797 × 10<sup>-5</sup>



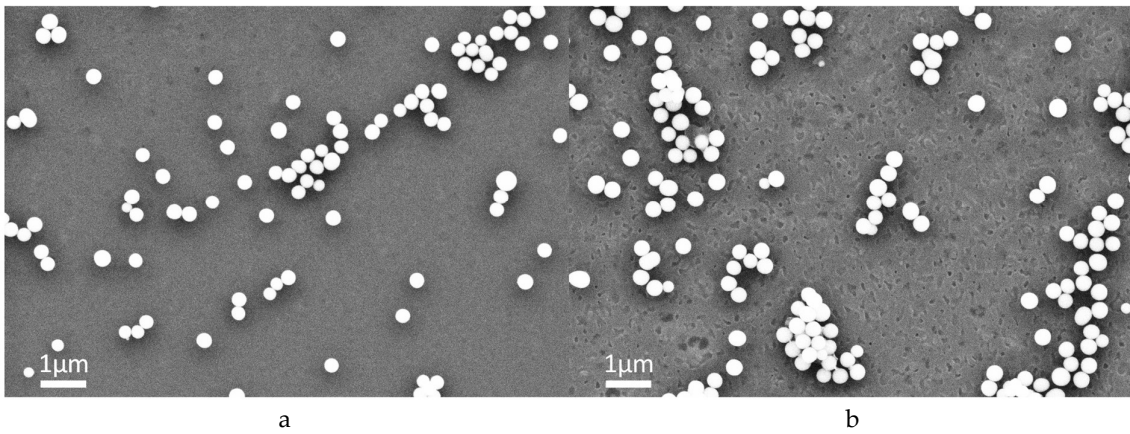
Supplementary Figure S1. TGA results of PEI surface functionalized MSNs in toluene [1] and [3] and base MSNs [2].



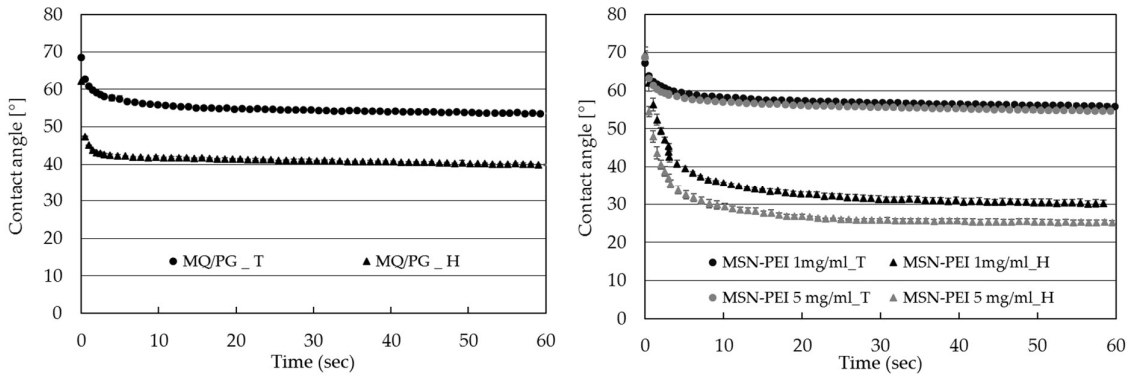
Supplementary Figure S2. TEM images of a) MSN without surface functionalization and b) MSN-PEI, scale bar 100 nm.



**Supplementary Figure S3.** The hydrodynamic particle size of MSN-PEI dispersed in MQ/PG (n=3) measured using DLS.



**Supplementary Figure S4.** SEM images of **a)** unloaded MSN-PEI *on the left* and **b)** drug-loaded MSN-PEI-F15 *on the right* printed on transparency film (scale bar 1  $\mu\text{m}$ ).



**Supplementary Figure S5.** Contact angle [ $^{\circ}$ ] versus time (sec) of MQ/PG, 1 mg/ml MSN-PEI and 5 mg/ml MSN-PEI, (n = 3) on Transparency (T) and HPMC (H) films.