Supporting Information

Bioevaluation of magnetic mesoporous silica rods: cytotoxicity, cell uptake and biodistribution in zebrafish and rodents.

Jan Grzelak,[a] Mariana Teles,[b] Nerea Roher,[b] Alba Grayston,[c] Anna Rosell,[c] Martí Gich[a*], Anna Roig[a*]

[a] *Institut de Ciència de Materials de Barcelona (ICMAB-CSIC).*
Campus UAB, 08193 Bellaterra, Catalonia, Spain.

[b] *Institute of Biotechnology and Biomedicine (IBB), Universitat Autònoma de Barcelona, 08193 Barcelona, Spain.*

[c] *Neurovascular Research Laboratory Vall d'Hebron, Research Institute (VHIR), 08035, Barcelona, Catalonia, Spain.*

* *corresponding authors: anna.roig@csic.es, mgich@icmab.es*

Fig. S1. TEM images of magnetic mesoporous silica rods. Long rods – Fe_2O_3@LR (a, b) and short rods – Fe_2O_3@SR (c, d).

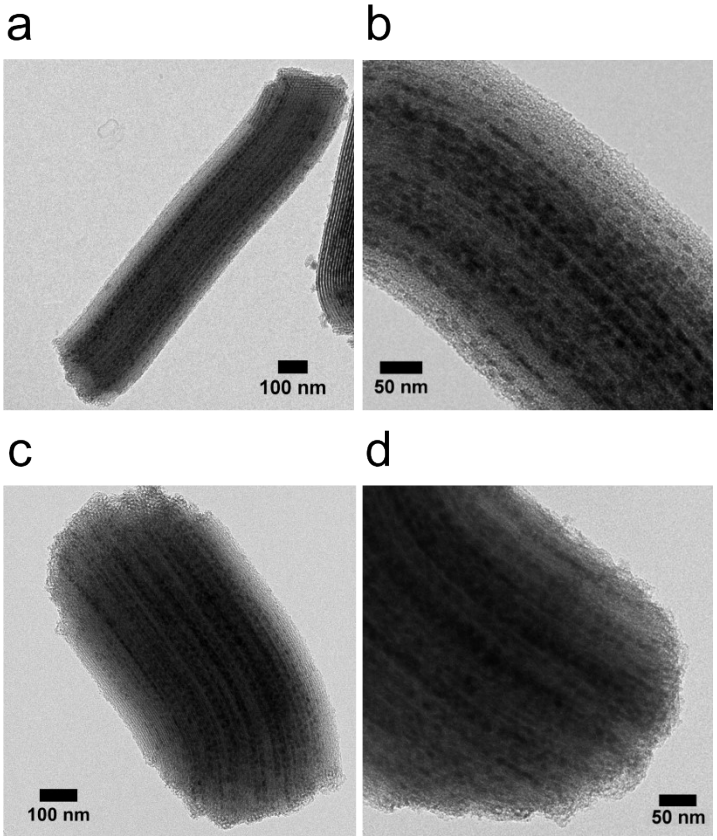


Fig. S2. Magnetic hysteresis loops measured at 10 K. a) Fe_2O_3@SR, b) pellet of ZFL cells incubated with Fe_2O_3@SR (100 µg/ml).

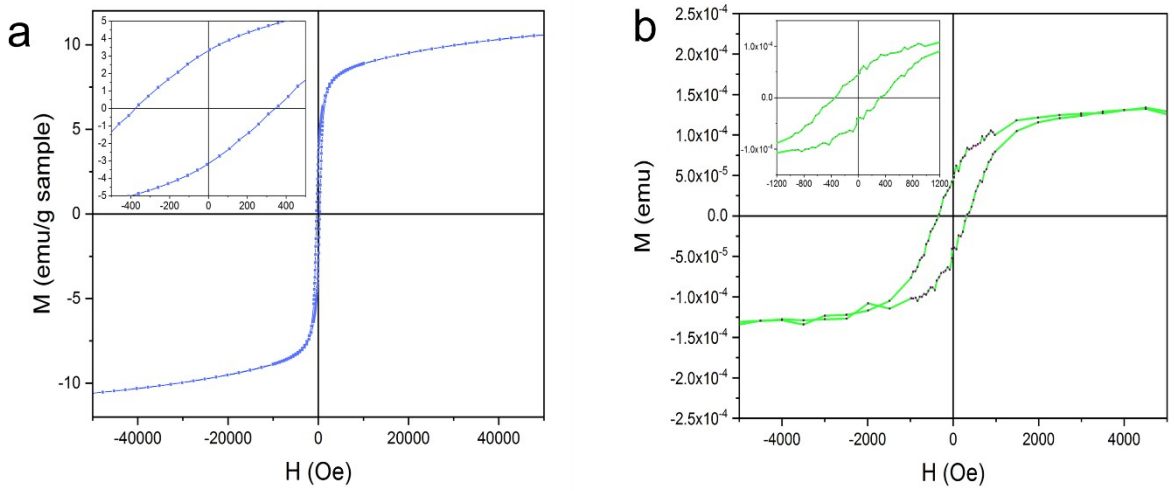


Table S1. Uptake of MSRs by ZFL cells studied by SQUID magnetometry. Mean values of the remanent magnetic moment at 10 K were measured for pellets of ZFL cells treated with different concentrations of Fe_2O_3@SR and Fe_2O_3@SR-NH_2 (n=4).

MSR sample	[MSR] (μg/ml)	m_r (10^{-6} emu)	m_r/cell (10^{-11} emu/cell)	MSR uptake (pg/cell)
Fe_2O_3@SR	20	2.2 ± 0.3	1.8 ± 0.3	5 ± 1
	50	24 ± 4	19.± 3	58 ± 9
	100	42 ± 12	34 ± 9	102 ± 28
Fe_2O_3@SR-NH_2	20	6 ± 6	5 ± 5	16 ± 17
	50	13 ± 4	11 ± 3	35 ± 11
	100	39 ± 10	31 ± 8	105 ± 26

Fig. S3. Zebrafish lifecycle. a) Zebrafish. b) Zebrafish eggs. c) Zebrafish eggs hatching. d) Zebrafish larvae. Scale bars: 1 cm. Zebrafish larvae survival after 96 h of exposure to fluorescamine-functionalized MSRs.

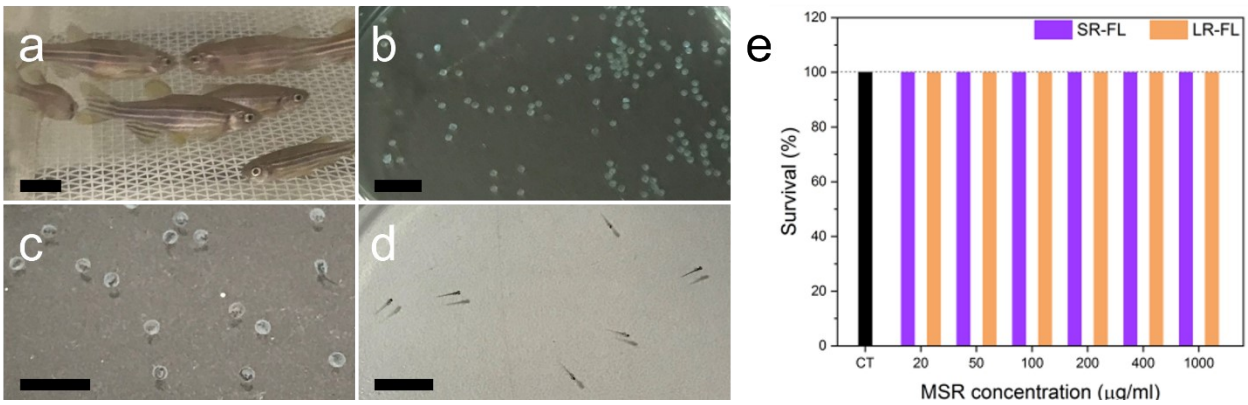
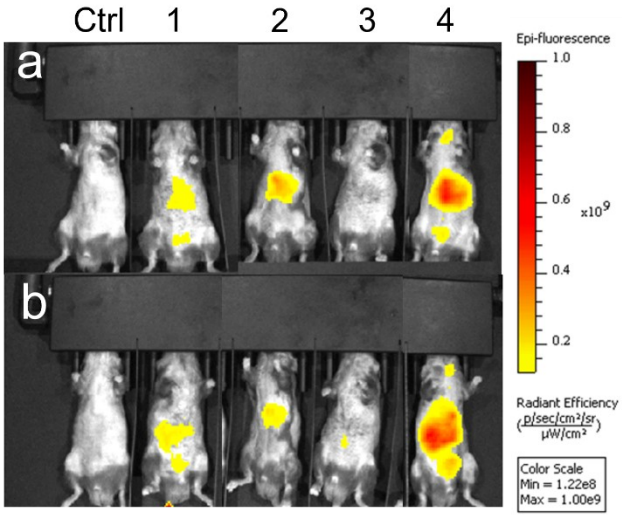


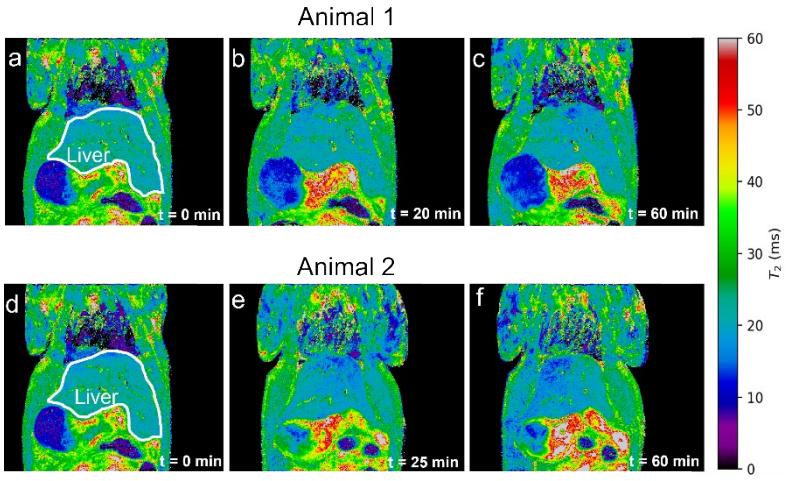
Fig. S4. *In vivo* fluorescence images of mice injected with Fe_2O_3@SR-Cy5 at (a) 30 min, (b) 60 min, c) *in vivo* fluorescence values measured in the abdomen at 30 min and 60 min post-injection.



c

Animal ID	*In vivo* fluorescence in the abdomen (TRE, [photons/s]/[µW/cm²], *vs* control)	
	30 min	60 min
1	2.8	2.6
2	2.8	1.8
3	1.8	1.4
4	5.6	5.8

Fig. S5. T_2 relaxation time maps of the abdominal area of (a, b, c) animal 1 and (d, e, f) animal 2 recorded at various times: t = 0 (pre-injection), t = 20-25 min and t = 60 min post-injection of Fe_2O_3@SR**.** T_2 values in the liver of the two studied rats, before and 60 min after MSR injection (g). Respiration and body temperature of the two studied rats were monitored after intravenous injection of Fe_2O_3@SR (h).



g

Animal	Time	T_2 (ms)
1	pre-injection	22± 5
1	60 min	21 ± 4
2	pre-injection	23 ± 6
2	60 min	20 ± 6

h