

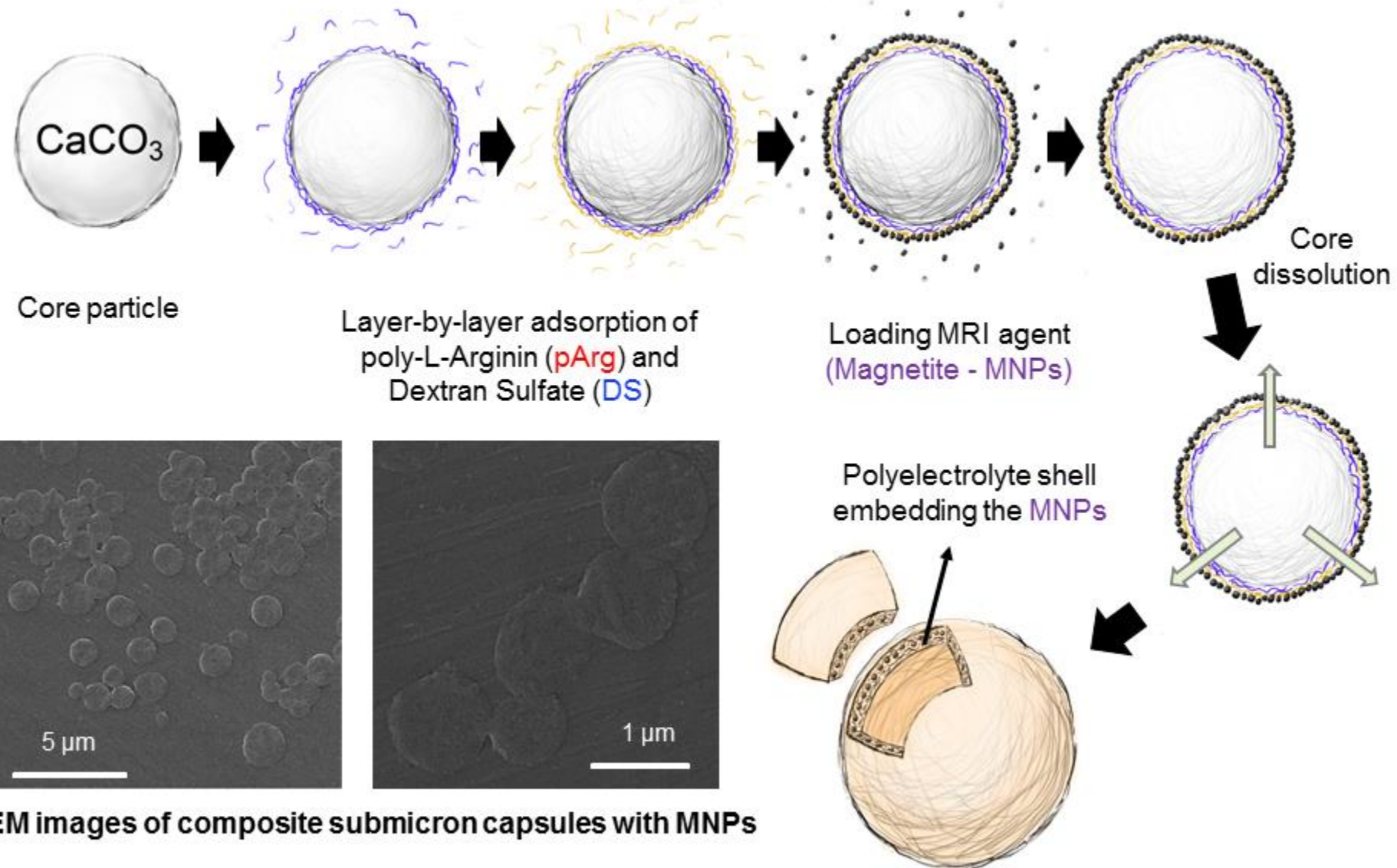


In vivo MRI imaging of submicron polyelectrolyte capsules loaded with magnetite nanoparticles under magnetic navigation

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MRI detectable submicron polyelectrolyte capsules



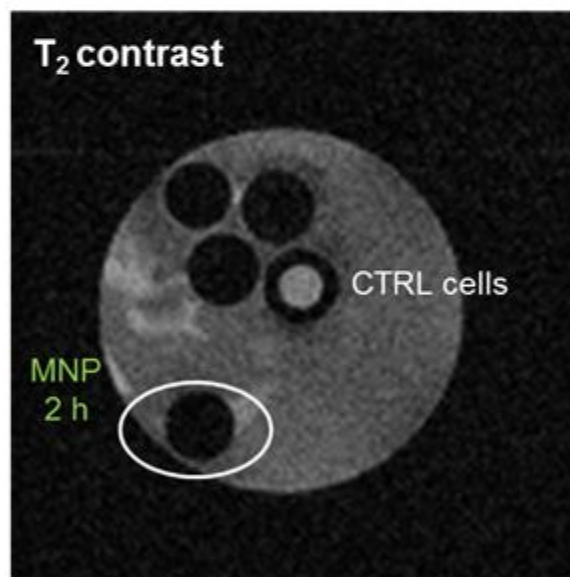
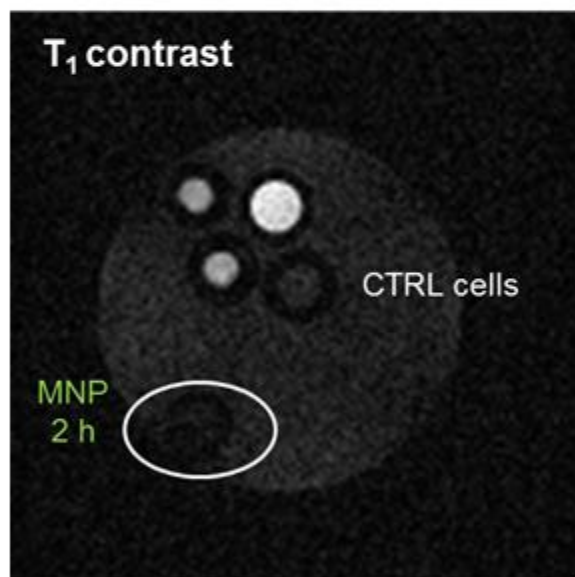
SEM images of composite submicron capsules with MNPs

In vitro characterization: relaxivity and macrophage uptake

	Structure	[Fe ³⁺] (mM)	r_1 (mM ⁻¹ s ⁻¹)	r_2 (mM ⁻¹ s ⁻¹)	r_2/r_1
MNP	CaCO ₃ /PArg/DS/PArg/MNP/PArg/DS	0.43	19.5	91.6	4.7

@ 0.5 T

r_2/r_1 @ 1 T = 11



Particles were incubated at 37°C with RAW 264.7 murine macrophages

Preliminary *in vivo* MRI experiments @1 T on a murine tumour model

Experimental protocol



- 1 million of TS/A cells (murine breast cancer) were inoculated subcutaneously in the right flank of female Balb/C mice (syngeneic model)



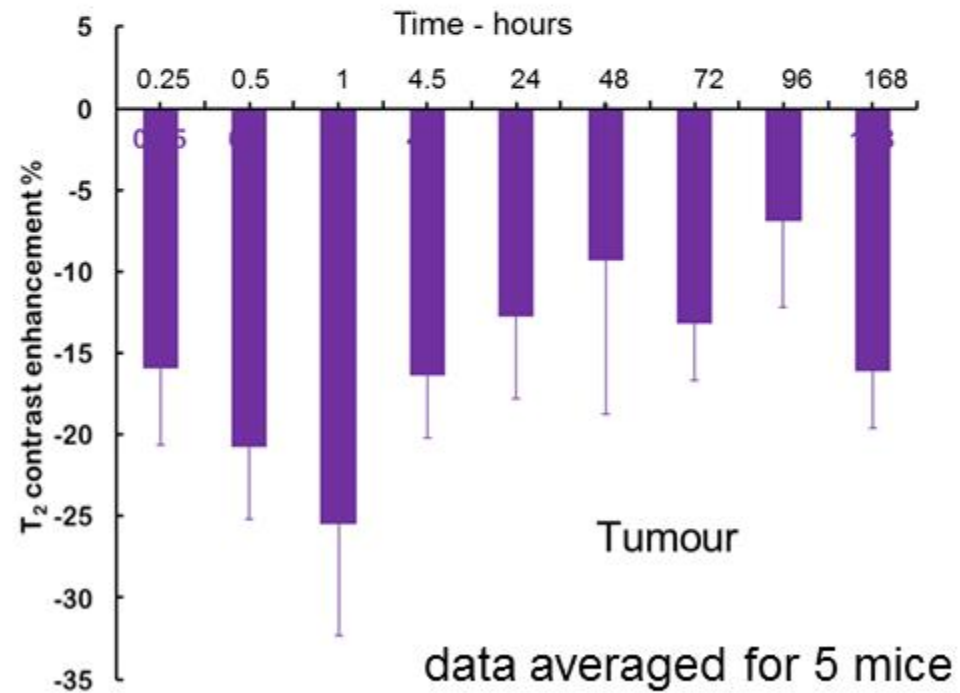
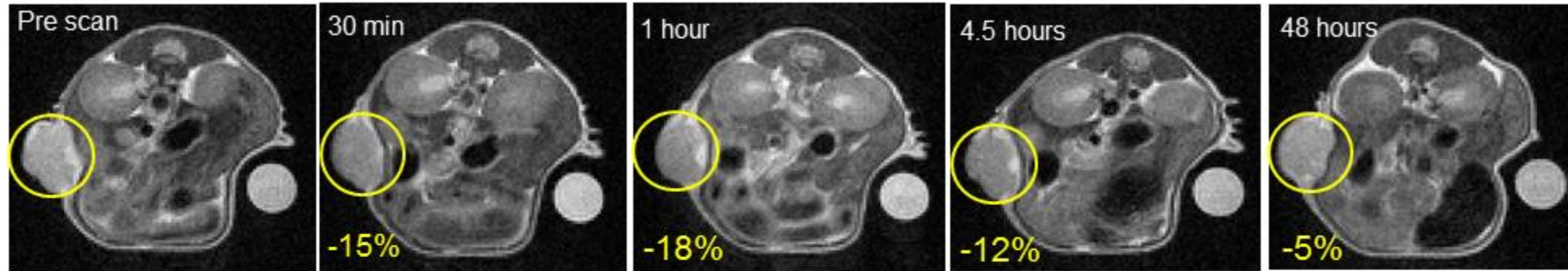
- 10 days post inoculation (tumor size around 3-5 mm) – 200 μ L of MNP batch (1×10^{10} capsules/kg bw) was intravenously administered to mice (4 mmol Fe/kg bw)



MRI

- T_{2w} MR images were acquired before and at different times (15 min, 30 min, 60 min, 4h30, 24 h and 48 h) post injection.
- The % T_2 Contrast Enhancement over pre images was calculated.

In vivo MRI experiments on a murine tumour model @ 1 T



Conclusions

- Submicron system based on magnetite-loaded polyelectrolyte capsules was designed for MRI detection (T_1 and T_2 contrast), prepared and characterized *in vitro* and *in vivo*.
- The capsules showed a good T_2 contrast *in vitro*.
- The system displayed a potential for cellular imaging purposes.
- Magnetite-loaded system injected in a murine breast cancer model showed a good T_2 contrast in tumour *in vivo*, without any signs of acute toxicity.

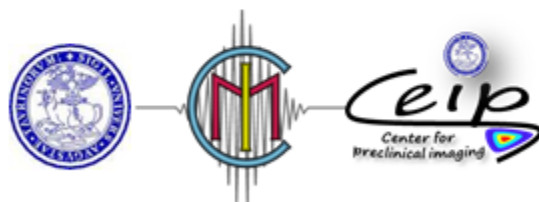
ACKNOWLEDGEMENTS



- Ms. Anastasiia Kozlova
- Ms. Ekaterina Lengert



- Dr. Sergey German
- Prof. Dmitry Gorin



Dr. Francesca Garello
Prof. Enzo Terreno