

Magnetolipogels: a combined strategy for controlled drug release

Sérgio R. S. Veloso,^a

Miguel A. Correa-Duarte,^b Paula M. T. Ferreira,^c
and Elisabete M. S. Castanheira,^a

^a Centro de Física (CFUM), University of Minho,
Campus de Gualtar, 4710-057 Braga, Portugal.

^b Department of Physical Chemistry, Center for
Biomedical Research (CINBIO), University of
Vigo, Vigo, Spain.

^c Centro de Química, University of Minho,
Campus de Gualtar, 4710-057 Braga, Portugal.

sergioveloso96@gmail.com

Supramolecular magnetogels comprise supramolecular hydrogels and magnetic nanocomposites, which allow the tailoring and modulation of the matrix structure and properties [1,2]. Here, the nanosystems stabilization remains a main challenge, as it has to ensure efficient drug encapsulation and avert the leaching out of nanoparticles. Hereby, in this work, lipid-coated nanoparticles incorporated in peptide hydrogels (magnetolipogels) were evaluated as a strategy for magnetogels development. Lipid-fibre interface domains averted leaching out of nanoparticles (figure 1). Further, the heating generation profiles were improved and triggered-release of doxorubicin was reproducible (figure 2). Overall, the here developed lipid-coated nanoparticles showed promising results for the development of supramolecular magnetolipogels aiming at the control of drug release.

References

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- [2] S. Veloso, J. Martins, L. Hilliou, C. O. Amorim, V. Amaral, B. Almeida, P. Jervis, R. Moreira, D. Pereira, P. Coutinho, P. Ferreira and E. Castanheira, *J. Mater. Chem. B*, 8 (2020) 45-64.

Figures

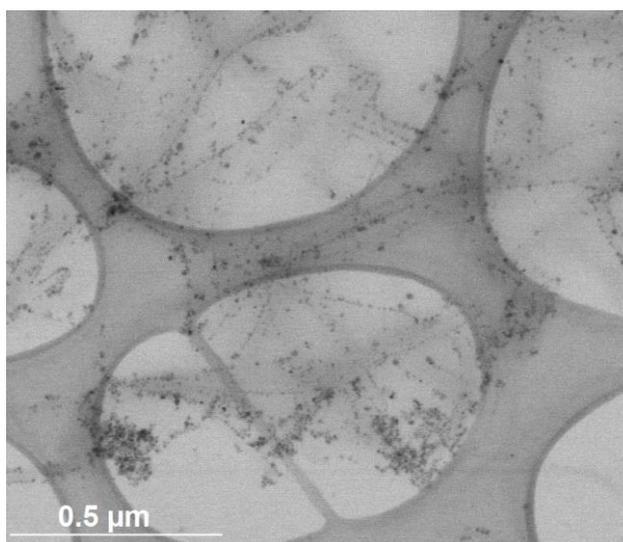


Figure 1: STEM image of the magnetolipogel (in a carbon honey-type mesh). Nanoparticles are adsorbed to fibres.

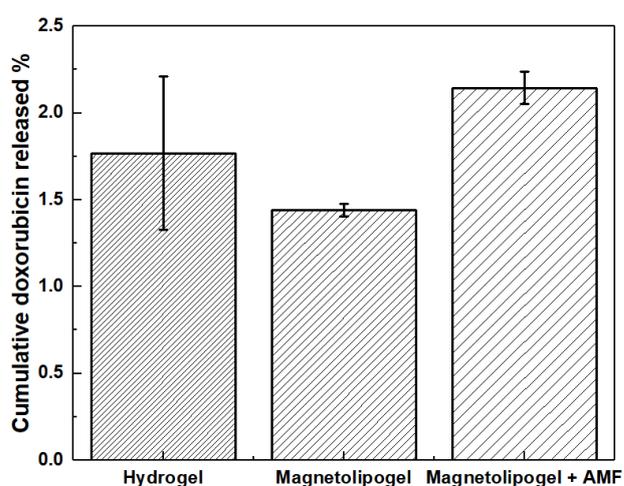


Figure 2: Comparison of cumulative doxorubicin released after 6 h from the hydrogel and magnetolipogel, with and without application of an alternating magnetic field for 30 min (AMF).