

Supramolecular magnetolipogels: a co-assembly strategy for on-demand drug release

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Abstract

Supramolecular hydrogels are promising materials in nanomedicine owing to the biocompatibility and similarity to cell matrix. The solvent pockets enable the loading and efficient transport of drugs as well as the encapsulation of composites. For instance, the combination with magnetic nanoparticles affords magnetic gels, which enable the real-time remote control of micro- and macroscopic properties of gels. Further combination with liposomes into magnetic lipogels enables the sequential and on-demand release of compartmentalized drugs, which together with the use of magnetic hyperthermia and the real-time monitorization through MRI makes these systems promising as theranostic systems. In this work, magnetic liposomes, both solid and aqueous, were loaded with a model drug and combined with dehydropeptide-based hydrogels. The encapsulated drug distributed between hydrogel fibres and magnetoliposomes lipid bilayer, which was demonstrated to be independent of the magnetoliposome's nanoarchitecture, resulting in an attenuated drug release from the magnetolipogels compared to hydrogels.

Biography:

Sérgio R.S. Veloso has his BSc degree in Biochemistry from the University of Minho (2017), and MSc degree in Biophysics and Bionanosystems (2019) from the same institution. He was granted a FCT PhD fellowship, and is PhD candidate in Physics by the PhD programme MAP-fis. His research is focused in soft matter materials for theranostic applications and drug delivery, besides colloidal science, mainly in liposomes, plasmonic and magnetic nanoparticles. Currently, his research has generated 9 international peer reviewed articles and/or conference proceedings ISI/Scopus, 1 book chapter, and at least 10 conference presentations. Orcid: 0000-0003-2724-5772