Solid magnetoliposomes entrapping new potential antitumor drugs for applications in cancer therapy

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Magneto-sensitive liposomes can be obtained by encapsulation of magnetic nanoparticles into liposomes or by the coverage of magnetic nanoparticles with a lipid bilayer. The so-called magnetoliposomes make possible to explore the synergistic effect between chemotherapy and magnetic hyperthermia in cancer therapeutics [1-3]. In this work, new solid magnetoliposomes (nanoparticle aggregates covered by a lipid/surfactant bilayer), containing manganese ferrite nanoparticles, have been developed. For that, a first layer of octadecylamine (ODA) was covalently linked to the nanoparticles surface and then covered by a layer of the phospholipid DPPC (second layer). These nanosystems exhibit diameters below 150 nm and the capability to interact with models of biomembranes (Giant Unilamellar Vesicles, GUVs) by fusion. The solid magnetoliposomes were successfully tested as nanocarriers for new fluorescent promising antitumor compounds, prepared by some of us, that present GI50 ≤ 10 microM selectively in the human tumor HCT15 cell line (colorectal adenocarcinoma) using the sulforhodamine B assay [4] (Figure 1).

![Figure 1](image)

Figure 1. Promising antitumor compounds for colorectal adenocarcinoma.

The developed nanosystems have shown promising results for future applications in dual cancer therapy, by combining magnetically-induced drug delivery and hyperthermia.

Acknowledgements: FCT-Portugal, FEDER, PORTUGAL2020 and COMPETE2020 for funding under Project PTDC/QUI-QFI/28020/2017 (POCI-01-0145-FEDER-028020) and Strategic funding of CF-UM-UP (UID/FIS/04650/2019) and CQUM (UID/QUI/00686/2019). J.M.R. PhD grant is financed by FCT, POCH and ESF.